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USER GUIDE

UGD032-0407

Carousel Plus Dryer

W Series Models 15, 25, 50, 75 and 100 with DC-1 Controls

INTRODUCTION • Purpose of the User Guide • How the guide is organized • Using the Carousel Plus W series dryer as a central dryer • Your responsibilities as a user • ATTENTION: Read this so no one gets hurt • How to use the lockout device • **DESCRIPTION** • What is the Carousel Plus W series dryer? • Typical applications • How it works • Specifications: Carousel Plus W series dehumidifying dryer • **INSTALLATION** • Unpacking the boxes • Preparing for installation • Positioning the dryer on the floor • Connecting the main power • Connecting the process RTD probe • Connecting the setback RTD probe • Checking for proper air flow • Connecting the air hoses • Connecting the dryer to the hopper •Connecting the water hoses • Mounting a loader on the hopper • Testing the installation • **OPERATION** • The W series dryer: control panel DC-1 • W dryer DC-1 control functions • Control function flow chart • Control function descriptions • To start drying • To stop drying • Using the auto start countdown function • How to disable the auto start

Please record your equipment's model and serial number(s) and the date you received it in the spaces provided.

It's a good idea to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Please keep this User Guide and all manuals, engineering prints and parts lists together for documentation of your equipment.

Date:

Manual Number: UGD032-0407

Serial Number(s):

Model Number(s):

* Display Firmware Version:

* Control Firmware Version:

* **NOTE:** Displayed upon initialization, during power up, or on a data tag inside the door.

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Purpose of the User Guide

This User Guide describes the Conair Carousel Plus W Series Dryers and explains step-by-step how to install, operate, maintain, and repair this equipment.

Before installing this product, please take a few moments to read the User Guide and review the diagrams and safety information in the instruction packet. You also should review manuals covering associated equipment in your system. This review won't take long, and it could save you valuable installation and operating time later.

How the Guide is Organized

Symbols have been used to help organize the User Guide and call your attention to important information regarding safe installation and operation.

Symbols within triangles warn of conditions that could be hazardous to users or could damage equipment. Read and take precautions before proceeding.

1 Numbers indicate tasks or steps to be performed by the user.

◆ A diamond indicates the equipment's response to an action performed by the user.

❒ An open box marks items in a checklist.

- A circle marks items in a list.

Indicates a tip. A tip is used to provide you with a suggestion that will help you with the maintenance and the operation of this equipment.

Indicates a note. A note is used to provide additional information about the steps you are following throughout the manual.

Using the Carousel Plus W Series as a Central Dryer

This manual incorporates the information necessary to use the Conair Carousel Plus W Series Dryer as a central dryer. Throughout this manual, information particular to central dyer application of the W series dryer is called out by the following treatment.

Central

This box will contain information or highlight system differences particular to the application of the W series dryer as a central dryer.

Your Responsibility as a User

You must be familiar with all safety procedures concerning installation, operation and maintenance of this equipment. Responsible safety procedures include:

- Thorough review of this User Guide, paying particular attention to hazard warnings, appendices and related diagrams.
- Thorough review of the equipment itself, with careful attention to voltage sources, intended use and warning labels.
- Thorough review of instruction manuals for associated equipment.
- Step-by-step adherence to instructions outlined in this User Guide.

ATTENTION:
Read this so no one gets hurt

We design equipment with the user's safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.

⚠ WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.

This equipment should be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

⚠ WARNING: Voltage hazard

This equipment is powered by three-phase alternating current, as specified on the machine serial tag and data plate.

A properly sized conductive ground wire from the incoming power supply must be connected to the chassis ground terminal inside the electrical enclosure. Improper grounding can result in severe personal injury and erratic machine operation.

Always disconnect and lock out the incoming main power source before opening the electrical enclosure or performing non-standard operating procedures, such as routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.

(continued)

ATTENTION:

Read this so no one gets hurt (continued)

We design equipment with the user's safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.

CAUTION: Hot Surfaces.

Always protect yourself from hot surfaces inside the dryer and hopper. Also exercise caution around exterior surfaces that may become hot during use. These include the hopper door frame, the exterior of an uninsulated hopper, the return air hose and the dryer's process filter housing and moisture exhaust outlet.

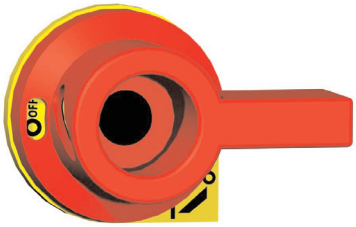
WARNING: Do not place aerosol, compressed gas or flammable materials on or near this equipment.

The hot temperatures associated with the drying process may cause aerosols or other flammable materials placed on the dryer or hopper to explode.

How to Use the Lockout Device

CAUTION: Before performing maintenance or repairs on this product, you should disconnect and lockout electrical power sources to prevent injury from unexpected energization or start-up. A lockable device has been provided to isolate this product from potentially hazardous electricity.

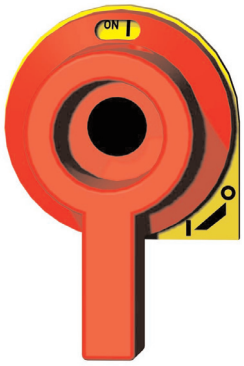
Lockout is the preferred method of isolating machines or equipment from energy sources. Your Conair product is equipped with the lockout device pictured below. To use the lockout device:



1. **Stop or turn off the equipment.**
2. **Isolate the equipment from the electric power.** Turn the rotary disconnect switch to the OFF, or "O" position.
3. **Secure the device with an assigned lock or tag.** Insert a lock or tag in the holes to prevent movement.
4. **The equipment is now locked out.**

WARNING: Before removing lockout devices and returning switches to the ON position, make sure that all personnel are clear of the machine, tools have been removed, and all safety guards reinstalled.

To restore power to the dryer, turn the rotary disconnect back to the ON position:



1. **Remove the lock or tag.**
2. **Turn the rotary disconnect switch to the ON or "I" position.**

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What is the Carousel Plus W Series Dryer?

The Carousel Plus W Series Dehumidifying Dryer produces hot, low-dewpoint air that removes moisture from hygroscopic plastics. The dryer pulls warm, moist air from a drying hopper and circulates it through a dehumidifying desiccant wheel. The dryer then heats the air to the drying temperature you selected and circulates it through the material in the hopper.

The dryer's closed-loop design ensures a continuous supply of hot, dehumidified air while preventing contamination from moisture in the plant.

Typical Applications

1 Dryer on the floor; hopper on the throat (15 - 100).

2 Hopper on a floor stand; the dryer next to it.

3 Central dryer with ResinWorks.

The Carousel Plus W Series Dryer can be used successfully in applications that require:

- A contamination-free drying environment.
- Drying temperatures within the ranges shown in the following table:

(continued)

Typical Applications (continued)

Model	Drying Temperature Range
Low temperature (with precooler)*	100° - 150°F {38° - 66°C}
Standard	150° - 240°F {66° - 116°C}
High heat (with aftercooler)*	150° - 375°F {66° - 191°C}
Low-high (with aftercooler & precooler)*	100° - 375°F {38° - 191°C}

* See page 3-12 and Appendix B

- Throughput rates of 15 to 100 lbs {6.8 to 37.3} per hour (some materials can be run at a higher rate).
- Dewpoints of -40°F {-40°C}.

Use the aftercooler when:

- You are drying at temperatures over 240°F {116°C}.
- Throughput rates are less than 50% of the dryer's rated capacity.
- You are pre-drying material at temperatures over 150°F {66°C}.

Dryer Options

- Dewpoint monitor/dewpoint control
- Audible and visual alarm
- Temperature setback

Central

When supplied for central drying applications, the W series dryer is not equipped with a process heater. Therefore, as a central dryer, the W dryer will only supply dry air to the hoppers.

How It Works

The Carousel Plus W Series Dryer achieves continuous, closed loop drying by passing air simultaneously through two heaters and a continuously rotating desiccant wheel.

The Process (Drying) Cycle

The process blower pulls moist air from the top of the drying hopper. The air passes through the process filter and aftercooler into the desiccant wheel, where moisture is removed. The now dry air moves through the optional precooler (if installed) and process heater, where it is heated to the drying temperature selected by the operator. The hot, dry air is delivered to the hopper where a spreader cone evenly distributes the air through the material.

The Process (Drying) Cycle

The process blower pulls moist air from the top of the drying hopper. The air passes through the process filter and aftercooler, then into the desiccant wheel, where moisture is removed. The dry air is delivered to the hopper (after it passes through the optional precooler, if installed) where a spreader cone evenly distributes the air through the material.

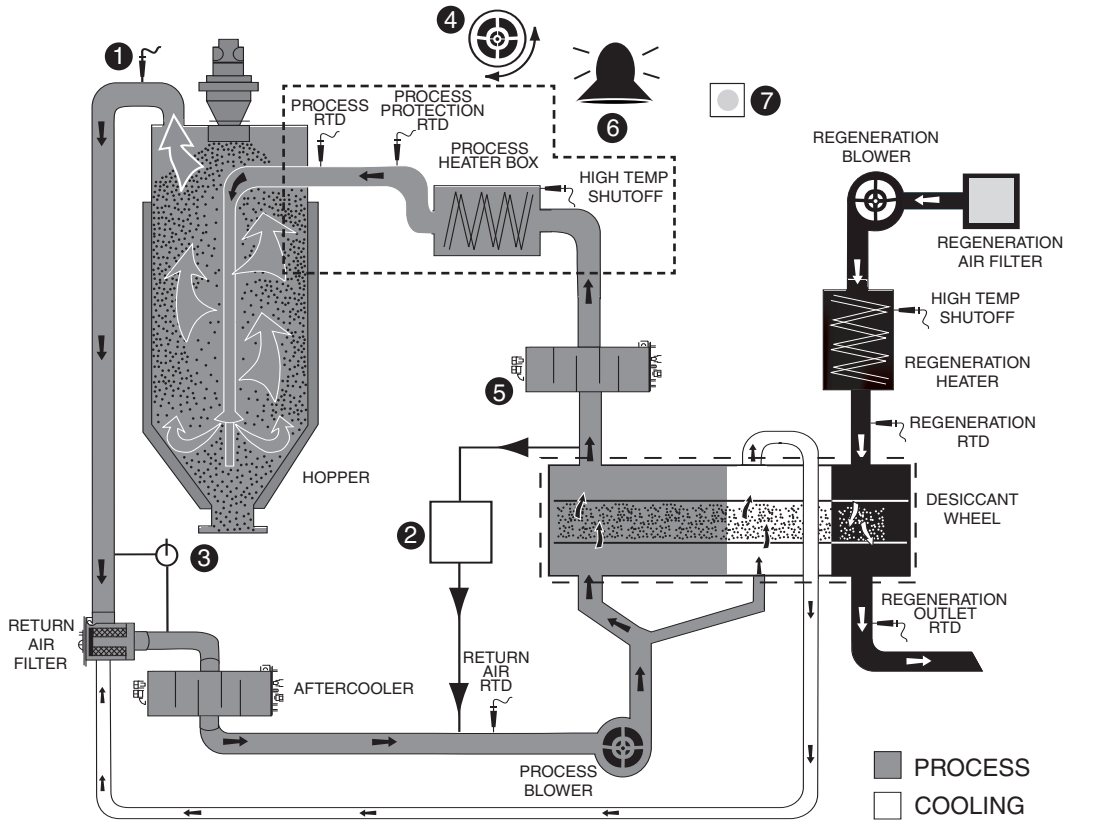
The Regeneration Cycle

The regeneration blower pulls air through the regeneration filter into the dryer's regeneration heater. The air is heated to 350° F {177° C} before it is pushed into the "wet" section of the wheel. The hot air purges moisture from the desiccant. The moist air is blown out the exhaust at the back of the dryer.

The Cooling Cycle

Regenerated desiccant must be cooled before it rotates back into the process cycle. The process blower pushes a small amount of air through the cooling section of the desiccant wheel. The cooling air then passes through the aftercooler and repeats the circuit.

How It Works (continued)



DRYER OPTIONS

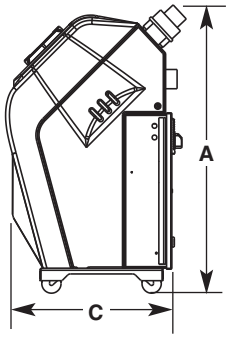
1 SETBACK TEMPERATURE
2 DEWPOINT MONITOR / CONTROL
3 PROCESS FILTER STATUS
4 PHASE ROTATION PROTECTION
5 PRECOOLER
6 ALARM BELL*
7 ALARM LIGHT*

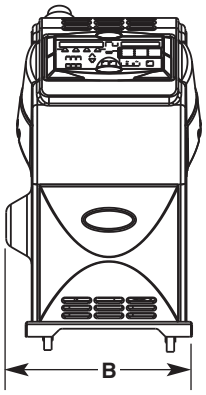
* Standard some DC-1 models (depending on the package ordered)

Central

The components identified by this type of box in the drawing are not supplied with the W dryer when it is configured as a central dryer.

Specifications: Carousel Plus W Series Dehumidifying Dryers





MODEL	W15	W25	W50	W75	W100
Performance characteristics (with full hopper)					
Drying temperature	All models150 - 375°F {66 - 191°C} with options				
Dewpoint	All models -40°F {-40°C}				
Dimensions inches {cm}					
A - Height	36.0 {91.5}		43.5 {110.5}		
B - Overall width	18.0 {45.7}		29.0 {73.7}		
C - Depth	21.0 {53.3}		28.5 {72.4}		
Outlet/inlet tube size OD	2.5				
Weight lbs {kg}					
Standard Dryer Installed	180 {82}	180 {82}	220 {91}	220 {91}	220 {91}
Voltage - Total Amps					
208 V/3 phase/60 Hz	14.7	14.7	19.7	20.6	NA
230 V/3 phase/60 Hz	13.3	13.3	17.8	18.6	24.9
400 V/3 phase/50 Hz*	7.7	7.7	10.2	10.7	14.3
460 V/3 phase/60 Hz	6.7	6.7	8.9	9.3	12.4
575 V/3 phase/60 Hz	5.3	5.3	7.1	7.5	10.0
Total kilowatts† kw {BTU/min}	2.1 {120}	2.1 {120}	3.3 {188}	4.1 {233}	4.4 {250}
Water requirements {for optional aftercooler or precooler}‡					
Recommended temperature§	45° - 85°F (7.2 - 29.4°C)				
Water flow gal./min. {liters/min.}	1 {4.6}		2 {7.6}		
Water connections NPT	3/8 in. NPT				

SPECIFICATION NOTES:

* Dryers running at 50 Hz will have 17% less airflow, and a 17% reduction in material throughput.

† Total kW listed at a process setpoint of 250°F {121°C} and a regeneration temperature of 350°F {177°C}.

‡ When drying below 150°F {66°C} a precooler is required.

§ Temperatures above or below the recommended levels may affect dryer performance. Tower, chiller or municipal water sources can be used.

Specifications may change without notice. Consult a Conair representative for the most current information.

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Carousel Plus W Series Dehumidifying Dryer Options

- **Volatile trap** - The volatile trap is recommended if drying materials that produce volitales that condense into a waxy or oily residue and/or if the material contains excessive fines. (Used only in conjunction with the standard aftercooler.)

- **Precooler** - The precooler reduces the temperature of air flow after the desiccant wheel and before the process heater, enables the dryer to control temperatures at low setpoints, 100º - 150ºF {38º - 66ºC}.

- **Dewpoint monitor/dewpoint control** - The dewpoint monitor/dewpoint control allows the operator to monitor and control the performance of the dryer's dewpoint level, making energy savings possible by reducing the regeneration temperature.

- **Temperature setback** - The temperature setback automatically reduces the drying temperature to a lower standby mode when the machine throughput is reduced or stopped, helping to minimize over drying material.

- **Audible/Visual alarms** - The audible and visual alarms are a combination of a blinking red alarm light and a horn that alerts the operator to a shutdown alarm.

- **Filter check** - The filter check sensor will activate a passive P10 alarm or a shutdown A29 alarm when the process filter is clogged or needs to be replaced.

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Unpacking the Boxes

The Carousel Plus W Series Dryer comes in one to four boxes, depending on the model and options ordered. The boxes could include (depending on the options selected):

- Carousel Plus W Series Dryer
- Delivery air hose - 10 ft {3.05 m} - Insulated with High Heat option.
- Return air hose - 10 ft {3.05 m}
- Process RTD
- Setback RTD (optional)
- User manual

1 **Carefully remove the dryer and components** from their shipping containers. Note that the dryer is secured to its shipping container with two bands and blocking.

2 **Remove all packing material,** protective paper, tape, and plastic.

3 **Carefully inspect all components** to make sure no damage occurred during shipping, and that you have all the necessary hardware.

(continued)

Unpacking the Boxes (continued)

4 **Take a moment to record serial numbers and electrical power specifications** in the blanks provided on the back of the User Guide's title page. The information will be helpful if you ever need service or parts.

5 **You are now ready to begin installation.**
Follow the preparation steps on the next page, then choose one of the three mounting options:

- Dryer on the floor; hopper on a floor stand.
- Dryer on the floor; hopper machine mounted.
- Central dryer with ResinWorks system.

Preparing for Installation

The Carousel Plus W Series Dryer is easy to install if you plan the location and prepare the mounting area properly.

1 **Make sure the mounting area provides:**

❒ **A grounded power source supplying the voltage and correct current** for your dryer model. Check the dryer's serial tag (on the side of your control box) for the correct amps, voltage, phase, and cycles. Field wiring should be completed by a qualified personnel to the planned location for the dryer. All electrical wiring should comply with your region's electrical codes.

TIP: If you plan to use vacuum or compressed air loaders to fill the hopper, install conveying lines to the drying hopper location.

❒ **A source of water, for the aftercooler and/or the optional precooler.** The Carousel Plus W Series dryer's aftercooler and optional precooler can use 2 gals./min. {7.6 liters/min.} tower, city, or chiller water at temperatures of 45° to 85°F{7° to 29°C}. Pipe should be ran to the planned dryer location. Use flexible hose to connect the water pipes to the aftercooler and/or precooler.

❒ **Minimum clearance for safe operation and maintenance.** You should maintain 24 in. {61 cm} clearance on all sides of the dryer.

Positioning the Dryer on the Floor

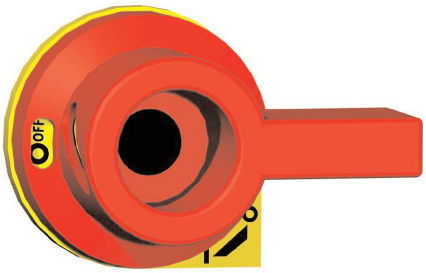
1 **Lift the dryer from the shipping container** using a fork truck.

2 **Position the dryer on the floor** near the processing machine. Make sure the location allows for the connection of all hoses.

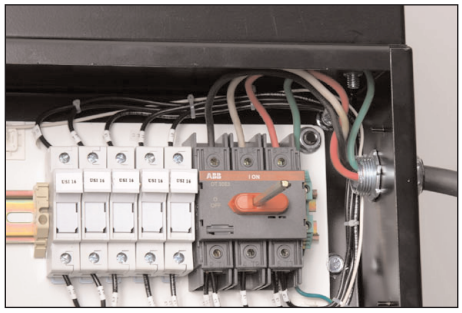
Connecting the Main Power

CAUTION: Always disconnect and lock out the main power sources before making electrical connections. Electrical connections should be made only by qualified personnel.

1 **Open the dryer's electrical enclosure.** Turn the disconnect dial on the dryer door to the Off or "O" position. Lock out the main power (see Page 1-6 for complete lock out information). Turn the captive screw, and swing the door open.



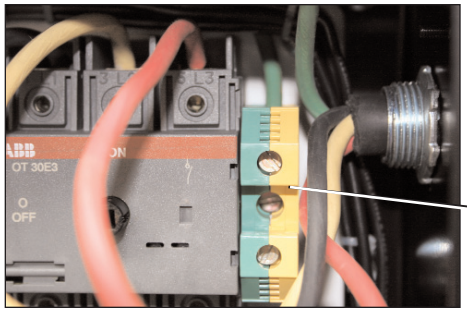
2 **Insert the main power wire** through the knockout in the side of the enclosure. Secure the wire with an appropriate strain relief.



IMPORTANT: Always refer to the wiring diagrams that came with your dryer before making electrical connections.

3 **Connect the power wires** to the three terminals at the top of the power disconnect

4 **Connect the ground wire** to the ground lug.



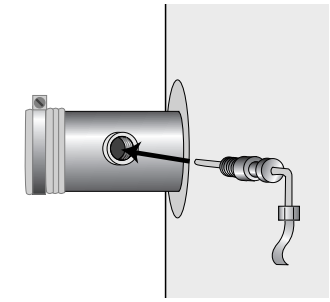
Ground Lug

Connecting the Process RTD Probe

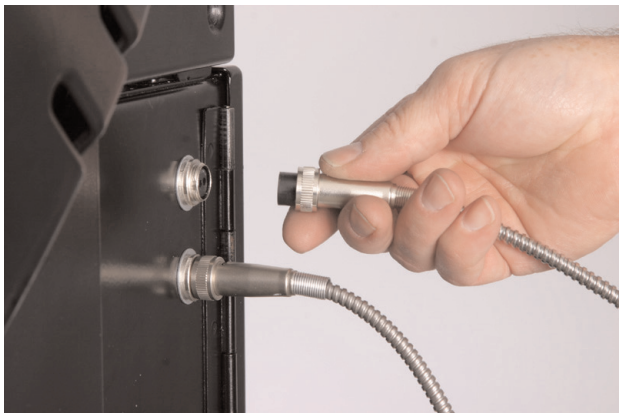
Central

When configured as a central dryer, there is no process heater or process RTD in the system. Therefore, installation and connection of the RTD probe and/or setback probe is not applicable.

The process RTD probe monitors the temperature of the drying air as it enters the hopper. If the probe is not installed correctly, temperature readings will be inaccurate.



1 **Insert the probe at the inlet to the hopper**. The end of the probe must not touch the walls of the tube. The tip of the probe should be approximately in the center of the tube. Tighten the compression fitting to lock the probe in place.



2 **Plug the probe's cable into the receptacle labeled process on the left side of the electrical enclosure.** Hand tighten the connector. Coil any excess cable and secure it with a wire tie.

Connecting the Setback RTD Probe (Optional)

1 **Insert the probe in the hopper outlet** at the top of the hopper. The end of the probe must not touch the walls of the tube. The tip of the probe should be approximately in the center of the tube. Tighten the compression fitting to lock the probe in place.

2 **Plug the probe's cable into the receptacle labeled setback on the left side of the electrical enclosure.** Hand tighten the connector. Coil any excess cable and secure it with a wire tie.

Checking for Proper Air Flow

This procedure is needed on W-50 through 100 models if the phase detection option was not ordered with the dryer.

⚠ **CAUTION:** This procedure must be performed before the dryer's air hoses are connected to the hopper. Performing this step after the air hoses are connected could cause damage to the dryer if the air flow direction is incorrect due to improper phase connection. **Material from the hopper can be pulled into the process heater, causing permanent damage.**

1 **Turn on the main power to the dryer.** Make sure the dryer's disconnect dial is in the ON position. This powers up the control and the display lights will illuminate.

2 **Set the drying temperature.** Press Setpoint Adjust (+) or (-) buttons to set the drying temperature to a low setpoint of 150ºF {66ºC}).

Central

When configured as a central dryer, the drying temperature can not be set since there is no process heater in the system.

Setpoint Adjust Buttons

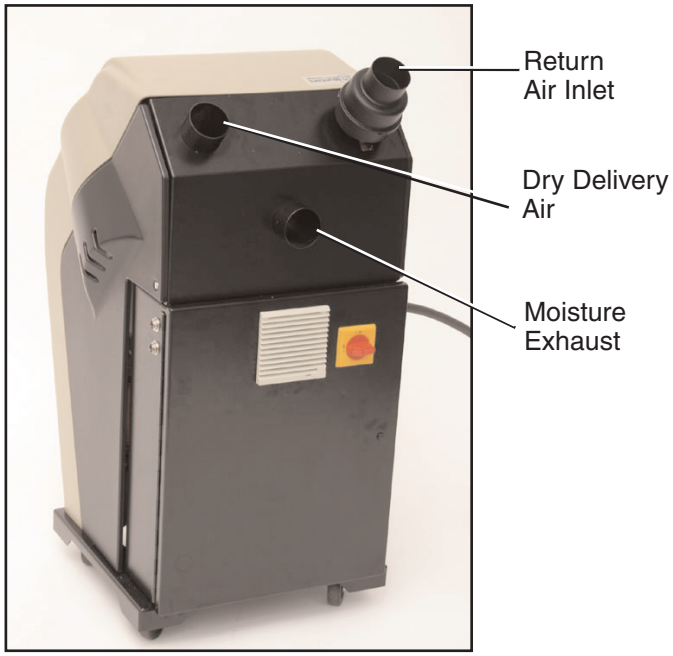
Checking for Proper Air Flow (continued)

3 **Press the START button.** Hold your hand near the delivery air outlet. You should feel air blowing out of the outlet.

NOTE: If the dryer is running for more than 20 to 30 seconds, the Process Loop Break alarm (A2) may occur because the Process RTD is not seeing the expected temperature rise.

CAUTION: Hot surface Do not place your hand directly on the delivery air outlet. The outlet and the air can get hot enough to burn your hand.

4 **Press the STOP button.**



5 If air flow is incorrect disconnect power, follow proper lockout procedures and swap any 2 of the 3 main power wires *(see photo, page 3-9).*

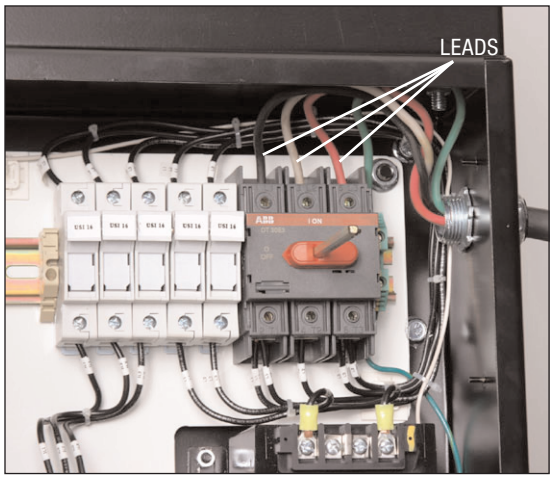
WARNING: All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the the machine serial tag and data plate.

(continued)

Checking for Proper Air Flow (continued)

INSTALLATION NOTE: Models 50, 75 and 100 use a three-phase process blower. If the dryer shuts down and a Process Loop Break shutdown alarm is indicated within the first few minutes of operation, check for proper air flow.

If the air flow is reversed, the process blower is turning in the wrong direction. Turn off and lock out the main power source. Open the electrical enclosure and reverse any two leads connecting the main power supply to the dryer.



WARNING: All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the the machine serial tag and data plate.

NOTE: If the dryer is running for more than 20 to 30 seconds, the Process Loop Break alarm (A2) may occur because the Process RTD is not seeing the expected temperature rise.

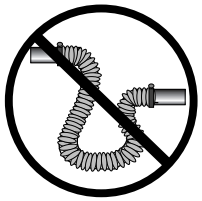
Connecting the Air Hoses

Using the two flexible hoses provided, connect the inlets and outlets of the drying hopper to the dryer. Make sure the dryer is located as close as possible to the hopper to reduce heat loss (10 ft {3.05 m} of hose supplied).

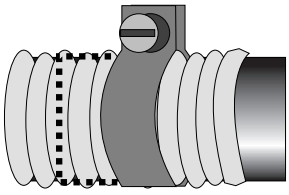
If you have ordered an insulated hose, it should be installed between the dryer outlet and the hopper inlet.

1 **Attach one hose** from the return air inlet of the dryer to the return air outlet from the top of the hopper.

2 **Attach one hose** from the delivery air outlet of the dryer to the delivery air inlet of the hopper.



✎ **NOTE:** Do not allow the flexible hoses to kink or crimp.



3 **Secure hoses with clamps.**
The hose clamp should be secured at least 1/4 in. (0.64 cm) from the end of the inlet or outlet tube.

Hose adapters are available from Conair.

Contact Conair Parts
(800) 458 1960
From outside of the United States, call:
(814) 437 6861

Connecting the Dryer to the Hopper

The W 15 - 100 dryers have 2 1/2 inch inlet and outlet hose connections.

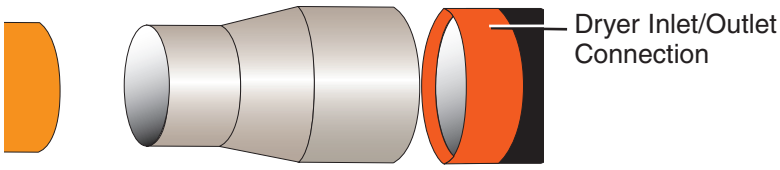
✎ **NOTE:** If your dryer hose connection and your hopper hose connection are not the same size, you will need a hose adapter. Contact Conair Parts 1 800-458-1960.

Connecting Air Hose Adapters

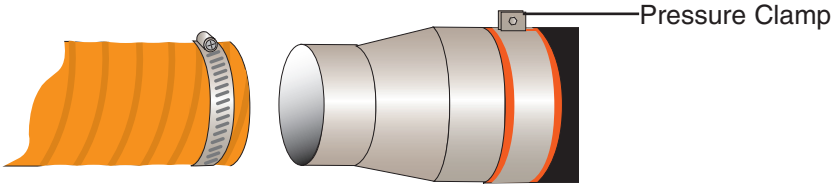
Depending on the hopper you purchased you may need to install an air hose adapter to connect the hopper to your dryer.

To connect the air hose adapter:

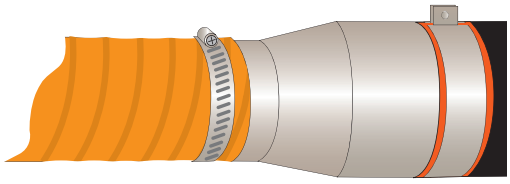
1 **Place a high temperature gasket approximately half way down from the end of the dry air delivery outlet.**



2 **Place hose adapter inside high temperature gasket flush to the dryer outlet, secure with pressure clamp.**



3 **Attach the hopper inlet hose over the adapter, secure with clamp.**



Connecting the Aftercooler and Optional Precooler (Optional)

IMPORTANT: Do not move the Carousel Plus W series 15 -100 dryer with the aftercooler and/or optional precooler water hoses attached. You must detach the water inlet/outlet hoses and move the dryer to its new location and then reattach the water inlet/outlet hoses. Failure to do so will harm your equipment.

IMPORTANT: When a precooler is purchased instead of an aftercooler, the precooler will be mounted in the aftercooler's location.

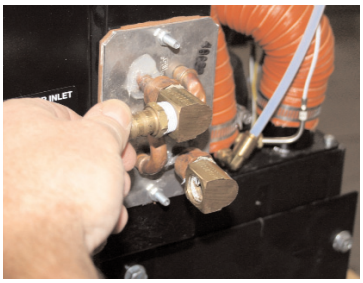
TIP: Make the water supply and discharge / return connections with flexible hoses at least 24 in. {61 cm} long. This allows you to easily remove the aftercooler or optional precooler assembly for cleaning.

TIP: If an optional flow control is also being installed with the aftercooler or optional precooler, the manual shut off valve should be installed on the inlet line for the flow control.

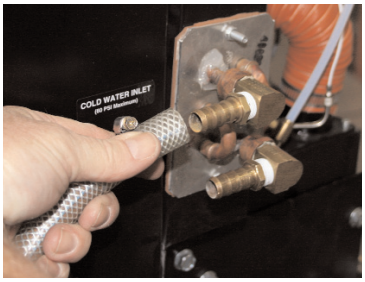
The aftercooler and optional precooler require 2 gals./min. {7.6 liters/min.} tower, city or chiller water and a discharge or return line.

1 **Remove the two (2) screws that secure the dryer's plastic cover, then remove cover.**

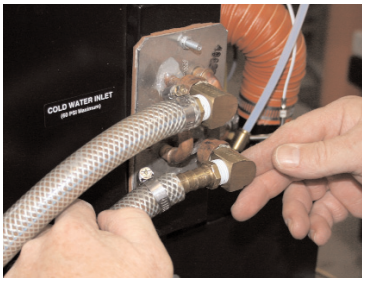
NOTE: 50-100 models have four (4) screws that secure the plastic cover to the dryer.



2 **Connect water fittings to the 90 degree tubing bend of the aftercooler or optional precooler. Seal the threads with silicon tape.**



3 **Connect water supply inlet. Secure with hose clamp.**



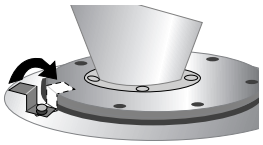
4 **Connect water supply outlet. Secure with hose clamp.**

5 **Replace plastic cover, resecure screws.**

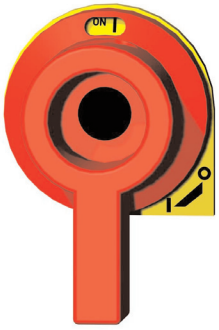
IMPORTANT: Turn the water off when the dryer is not in use to prevent condensation.

Mounting a Loader on the Hopper

If you have a Conair loader or vacuum receiver, you can use the flange and mounting clips provided on the top of the hopper. Refer to the manuals that came with your receiver or loader for detailed installation instructions.



Testing the Installation

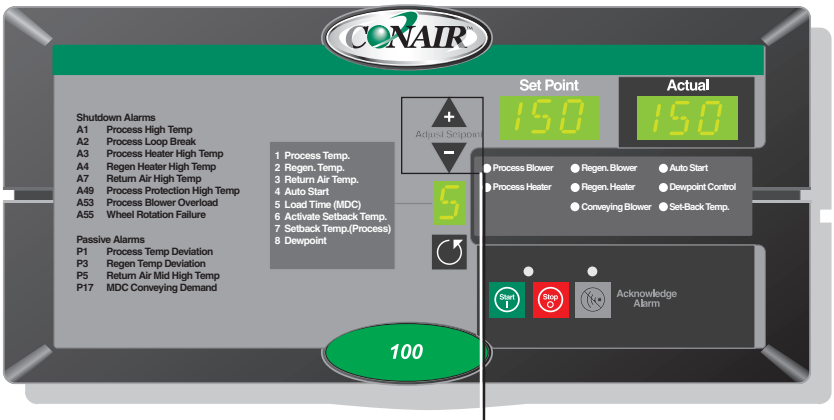


You have completed the installation. Now it's time to make sure everything works.

1. **Make sure there is no material in the hopper.** If you have mounted a loader or vacuum receiver on the hopper, disconnect the material inlet hose at the source or turn the loader off.

2. **Turn on the main power to the dryer.** Make sure the dryer's disconnect dial is in the ON position. This powers up the control and the display lights will illuminate.

3. **Set the drying temperature.** Press Setpoint Adjust (+) or (-) buttons to set the drying temperature to a low setpoint of 150ºF {66ºC}.



Setpoint Adjust Buttons

Central

When configured as a central dryer, the drying temperature can not be set since there is no process heater in the system.

(continued)

Testing the Installation (continued)

4 Press the START button.

If everything is installed correctly:

- The green light on the start button will illuminate.
- The process and regeneration blowers turn on and the display LEDs will illuminate.
- The process and regeneration heaters turn on and the display LEDs will illuminate.
- The desiccant wheel starts turning.

✎ **NOTE:** If the dryer is running for more than 20 to 30 seconds, the Process Loop Break alarm (A2) may occur because the Process RTD is not seeing the expected temperature rise.

Central

- The green light on the start button will illuminate.
- The process and regeneration blowers turn on and the display LEDs will illuminate.
- The regeneration heater turns on and the display LED will illuminate.
- The desiccant wheel starts turning.

5 Press the STOP button.

If everything is installed correctly:

- The blowers will continue running as needed to cool the heaters (until both heaters are less than 150°F {66ºC}).

6 The test is over. If the dryer performed the normal operating sequences as outlined, you can load the hopper and begin operation. If it did not, refer to the *Troubleshooting section* of the User Guide.

SECTION
4

Operation

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Carousel Plus W Series Dryer: Control Panel DC-1

Increment/Decrement Buttons

Used to increase and/or decrease the set-point of a control function.

Setpoint Display

Shows the setpoint value.

Actual Display

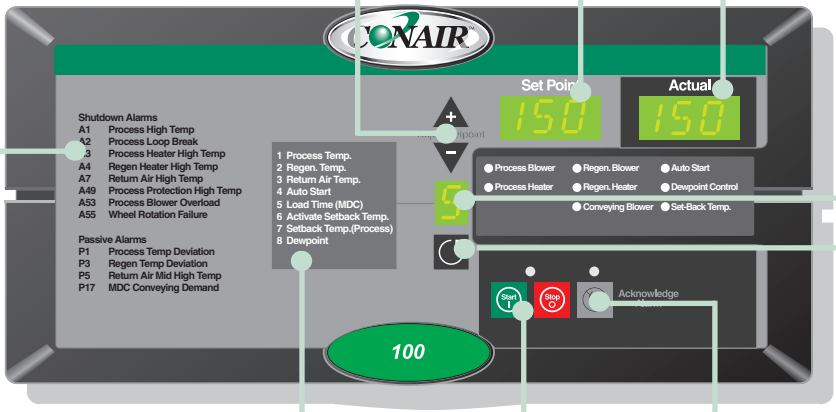
Shows the actual temperature value.

Menu Number Display

Displays the menu number corresponding to what is shown in the setpoint and actual displays. Can also display letters for alarms and setup.

Alarm Codes

See *Troubleshooting Section* for a more complete listing of alarms.



Scroll Button

Press to scroll through the closed loop menu list. Pressing the Scroll button moves you down the list.

Menu List

Numbers 1, 2, 3, and 4 are standard items that will always be present. Numbers 6, 7 and 8 are screens associated with options. If the option is not installed, the screens will not be displayed.

Start and Stop Buttons

Press **"Start"** to start the dryer.
Press **"Stop"** to stop the dryer.

Acknowledge Alarm Button

Press once to silence the optional audible alarm and display alarm messages. Press again to clear the alarm. If pushed when there is no active alarm, the most recent alarm code is displayed.

Central

Menu List

Numbers 2, 3, and 4 are standard items that will always be present. Number 8 is a screen associated with an option. If the option is not installed, the screens will not be displayed.

Carousel Plus W Series Dryer Control Functions

Dryer functions are values that you can set or monitor. Press the Scroll button to access the function within a Menu list until the function you want to set or monitor appears in the LED display.

✎ **NOTE:** Grey shaded screens denote optional functions. If the options were not purchased with the dryer, those screens will not appear.

Control Function Flow Chart

The following flow chart provides a quick summary of the control functions. For an explanation of each control function, see Control Function Descriptions. Screen numbers correspond with numbers beside each block in the flow chart.

NOTE: Screens 1-4 are only displayed during initialization.

Central

5 | 1 | CNT | DRY

Central

When supplied for central drying applications, these control functions are not available.

screen #		Display Menu Number	Setpoint Display	Actual Display	
			POWER ON		
1			Pr	up	5 sec
2			CPC	25	5 sec - Model Designator
3	C		v2.0	5.01	1 sec - Control Software Version
4	d		v2.0	5.02	1 sec - Display Software Version
5	1		250	250	Process Temp Default Screen
6	2		425	425	Regen Temp
7	3		100	100	Return Air Temp
8	4		16	On	Auto Start
10	6		150	120	Activate Setback Temp (Option)
11	7		145	250	Setback Temp Process (Option)
13	8			-40	Dewpoint Monitor
14	0			0	Password Screen

Setup			Access Code 754	Test Mode			Access Code 755	Alarm History			Access Code 756
15	C	10	C01	28	H	off	1	44	A	1	P3
16	C	385	C02	29	H	off	2	44	A	2	A1
17	C	off	C03	30	H	off	3	44	A	3	A5
18	C	350	C04	31	H	off	4	44	A	4	A4
19	C	off	C05	32	H	off	5	44	A	5	P1
21	C	20	C07	33	H	off	6	44	A	6	P5
22	C	200	C08	34	H	off	7	44	A	7	A1
23	C	20	C09	35	H	off	8	44	A	8	A7
24	C	off	C10	36	H	off	9	44	A	9	A2
45	C	off	C11	37	H	off	10	44	A	10	A6
26	C	off	C12	38	H	off	11				
27	C	off	C13	39	H	off	12				
46	C	off	C14	40	H	off	13				
47	C	F	C15	41	H	off	14				
				42	H	off	15				
				43	H	off	16				

Control Function Descriptions

Screen	Function
SCREEN 1 [ ] [Pr] [up]	Once the power is turned on, this screen is displayed for 5 seconds while the control goes through self-checking.
SCREEN 2 [ ] [CP] [25]	Once the power is turned on and screen 1 has been displayed for 5 seconds, this screen is displayed for another 3 seconds. It shows the dryer model number for which the control is configured.
SCREEN 3 [C] [v2.0] [5.01]	After the model number is displayed, this screen flashes for 1 second and displays the control board software version.
SCREEN 4 [d] [v2.0] [5.02]	After the control versions is shown, the screen flashes again for 1 second and displays the display board software version.
SCREEN 5 (Default Screen) [1] [250] [250]	This is the DEFAULT screen. It shows the process air temperature setpoint and actual temperature measured at the inlet to the drying hopper. The (+) or (-) buttons can be used to change the setpoint. Holding the (+) or (-) buttons in will cause the number to ramp up faster the longer the button is held. The display will return to the default screen from anyplace in the menu structure if nothing is done after 10 minutes.
SCREEN 5 (Default Screen) [1] [CNT] [DRY]	Indicates configuration as a central dryer. This screen will be displayed when the dryer has been configured as central.
SCREEN 6 [2] [350] [350]	Shows the regeneration air setpoint and actual temperature. The setpoint can not be changed from this screen; it is shown only as a reference.

Central

When supplied for central drying applications, this function is not available.

Control Function Descriptions (continued)

Screen	Function
SCREEN 7 	This screen shows the actual return air temperature measured at the inlet to the process blower. If the optional aftercooler flow control is installed, a setpoint will be displayed on this screen. The (+) or (-) buttons can be used to change the set point. Holding the (+) or (-) buttons in will cause the number to ramp up faster the longer the button is held.
SCREEN 8 	This screen is used to set the dryer to auto start. The dryer must be on, but not running to set auto start. The value shown is the countdown time setpoint. It is adjustable from 0.1 hours to 150 hours. Once the countdown time is set, press the "**Start"** button. The display will show ON to tell the operator that the auto start is ON and counting. The auto start LED on the display also flashes green when the auto start is armed and counting down. The LED will turn solid green when the dryer starts. The dryer will begin operating when the control has finished counting down.

Control Function Descriptions (continued)

Screen	Function
SCREEN 10 (Setback Temperature Option) 6 150 120	If the dryer has the setback on temperature option installed, this is the temperature setpoint for the air at the outlet of the drying hopper. When this setpoint is reached, the dryer will automatically change the process setpoint to the setpoint shown on Menu number 7, Screen 11. When the temperature at the outlet of the hopper drops below the setpoint (entered on this screen, (in this example 150) by the value shown under C09, Screen 23, the dryer will return to the normal drying setpoint.
SCREEN 11 (Setback Options) 7 145 250	If the dryer has the setback on temperature option installed, this is the temperature setpoint to which the process air will revert once the air at the outlet of the hopper has reached its setpoint (Screen 10, Menu number 6).

Central

When supplied for central drying applications, these functions are not available.

NOTE: See information on page 4-22 for activating and using the setback option.

Control Function Descriptions (continued)

Screen	Function
SCREEN 13 (Dewpoint Monitor Option) **8** **-30** **-40**	If the dryer has the dewpoint monitor option installed, this screen will show the actual dewpoint of the process delivery air measured after the desiccant wheel. With the dewpoint monitor option installed, there will only be an actual display (no set-point value). Although the dryer is capable of producing dewpoints much lower than -40°F {-40°C}, the minimum sensor range is -40°F {-40°C}.
SCREEN 14 **0** **0**	This is the password entry screen that gives the user access to the Set Up, Test Mode, and Alarm History screens. The user can get to the password protected control functions through this screen by pressing the scroll button and the adjust setpoint button at the same time. This works only if you are on menu #1 (default screen). The access codes are as follows: Set Up Screens 754 Test Mode Screens 755 Alarm History Screens 756 To exit the password section, enter 500 and press scroll or cycle the power.
Screens 15-27 require access code 754.	
SCREEN 15 (Set up Screen) **C** **10** **C01**	This is the process deviation temperature screen. The range is 5 to 20°F {3 to 11°C}. This is the deviation temperature band around the set point. If the dryer goes outside this band, the dryer will display a passive alarm (P1).

Central

When supplied for central drying applications, these functions are not available.

Control Function Descriptions (continued)

Screen	Function
Screens 15-27 require access code 754.	
SCREEN 16 (Set up Screen) C 375 C02	This is the process high temperature screen. This is the high temperature limit. If the process temperature reaches this setpoint, the dryer will shutdown on alarm A1. The range is 100 - 450°F {38 - 232°C} (actual temperature).
SCREEN 17 (Set up Screen) C off C03	This is the process heater autotune screen. The autotune function can be turned on by pressing the (+) key. Once the (+) key is pressed, the screen will show On and then start the autotune process. This may take a minute or so to complete. When finished, the display will read "don". The new PID values are automatically saved. An autotune should be performed on a cold dryer. Before beginning autotune, be certain your normal drying temperature has been entered on Screen 5, Menu number 1.
SCREEN 18 (Set up Screen) C 350 C04	This is a regeneration temperature screen. ✎ **NOTE:** There is normally no need to change this temperature.
SCREEN 19 (Set up Screen) C off C05	This is the regeneration heater autotune screen. The autotune function can be turned on by pressing the (+) key. Once the (+) key is pressed, the screen will show On and then start the autotune process. This may take a minute or so to complete. When finished the display will read "don". The new PID values are automatically saved. An autotune should be performed on a cold dryer. It will autotune to the value entered on Screen 18.

Central

When supplied for central drying applications, these functions are not available.

✎ **NOTE:** Software may allow the Process temperature setpoint limit up to 450°F {232°C}, however Conair does not recommend a setpoint limit over 375°F {191°C} due to nuisance alarms.

Control Function Descriptions (continued)

Screen	Function
Screens 15-27 require access code 754.	
SCREEN 21 (Set up Screen) Regeneration Differential Temperature C 20 C07	This screen shows the differential temperature at the regeneration inlet and the outlet at the desiccant wheel. If the actual temperature is under the set value, the dryer will alarm (P31), but will still run.
SCREEN 22 (Set up Screen) Regeneration Outlet temperature C 20 C08	This screen is the actual temperature measured at the regeneration outlet on the wheel.
SCREEN 23 (Set up Screen) Setback Temperature Band Option C 20 C09	This screen is the Setback Temperature Band screen. This temperature is the amount the return air out of the hopper has to drop below the activate setback temperature before the original process temperature is restored. For example, if the activate setback temperature was 180°F {82°C} and the dryer was in setback. The actual temperature measured at the outlet to the hopper would have to drop below 160°F {71°C} to restore the original process setpoint.
SCREEN 24 (Set up Screen Option) Aftercooler Flow Control Enable C off C10	This screen is the Aftercooler Flow Control Enable screen. By pressing the (+) or (-) keys, the setting can be changed. With this off or disabled, the dryer will not open the flow control valve and try and control the return air temperature. There will also be no set point value on Menu number 3, Screen 7.

Central

When supplied for central drying applications, these functions are not available.

Control Function Descriptions (continued)

Screen	Function
Screens 15-27 require access code 754.	
SCREEN 26 (Set up Screen) C off C12	Reserved function, this should always be off.
SCREEN 27 (Set up Screen) Precooler Option C off C13	This screen shows how the precooler is set to operate. If it is set to "Off" the control assumes the precooler is not installed in the process line and will not control well below 150°F {66°C}. If the screen is set to "On" the control will assume the precooler is connected in the process line and will only allow setpoints from 100 to 150°F {38 to 66°C}. The control will also assume that the water flow rate is set manually with a ball valve and make no attempt to control water flow. The precooler option must be installed for this screen to appear. **NOTE:** If this function is set to off, make sure the water to the precooler is turned off.
Screen 28-43 require access code 755.	
SCREEN 28 (Test Mode Screen) H off 1	This is the Test Mode screen for the process blower. By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the process blower output will be turned on for 3 seconds and then shut off automatically.

Central

When supplied for central drying applications, these functions are not available.

Control Function Descriptions (continued)

Screen	Function
Screen 28-43 require access code 755.	
SCREEN 29 (Test Mode Screen) 	This is the Test Mode screen for the process heater. By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the process heater output will be turned on for 3 seconds and then shut off automatically. ✎ **NOTE:** The isolation contactor will not be engaged therefore no electricity will go the heater. The solid state relay contacts should close.
SCREEN 30 (Test Mode Screen) 	This is the Test Mode screen for the regeneration blower. By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the regeneration blower output will be turned on for 3 seconds and then shut off automatically.
SCREEN 31 (Test Mode Screen) 	This is the Test Mode screen for the regeneration heater. By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the regeneration heater output will be turned on for 3 seconds and then shut off automatically. ✎ **NOTE:** The isolation contactor will not be engaged therefore no electricity will go the heater. The solid state relay contacts should close.
SCREEN 32 (Test Mode Screen) 	This is the Test Mode screen for the wheel motor. By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the wheel motor output will be turned on for three seconds and then shut off automatically.
SCREEN 33 (Test Mode Screen) 	This Test Mode screen is not used in the current program.

(continued)

Control Function Descriptions (continued)

Screen	Function
Screen 28-43 require access code 755.	
SCREEN 34 (Test Mode Screen) 	This is the Test Mode screen for the isolation contactor. By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the isolation contactor output will be turned on for 3 seconds and then shut off automatically.
SCREEN 35 (Test Mode Screen) 	This is the Test Mode screen for the alarm output (horn and/or red light). By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the alarm output will be turned on for 3 seconds and then shut off automatically. ✎ **NOTE:** The alarm light on the membrane switch will not come on. If the optional alarm horn or red light is not installed nothing will happen.
SCREEN 36 (Test Mode Screen) 	This is the Test Mode screen for the precooler flow control valve. By pressing the (+) or (-) keys the setting can be changed. When set to "On" the precooler flow control valve output will be turned on for 3 seconds and then shut off automatically. ✎ **NOTE:** If the optional precooler flow control valve is not installed nothing will happen.
SCREEN 37 (Test Mode Screen) 	This is the Test Mode screen for the aftercooler flow control valve. By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the aftercooler flow control valve output will be turned on for 3 seconds and then shut off automatically. ✎ **NOTE:** If the optional aftercooler flow control valve is not installed nothing will happen.
SCREEN 38 (Test Mode Screen) 	This screen is not used in the current program.

Control Function Descriptions (continued)

Screen	Function
Screen 28-43 require access code 755.	
SCREEN 39 (Test Mode Screen) H off 12	This screen is not used in the current program.
SCREEN 40 (Test Mode Screen) H off 13	This screen is not used in the current program.
SCREEN 41 (Test Mode Screen) H off 14	This screen is not used in the current program.
SCREEN 42 (Test Mode Screen) H off 15	This is the Test Mode screen for the alarm output (yellow light). By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the alarm output will be turned on for 3 seconds and then shut off automatically. ✎ **NOTE:** If the optional tricolor light is not installed nothing will happen.
SCREEN 43 (Test Mode Screen) H off 16	This is the Test Mode screen for the alarm output (green light). By pressing the (+) or (-) keys, the setting can be changed. When set to "On", the alarm output will be turned on for 3 seconds and then shut off automatically. ✎ **NOTE:** If the optional tricolor light is not installed nothing will happen.

Control Function Descriptions (continued)

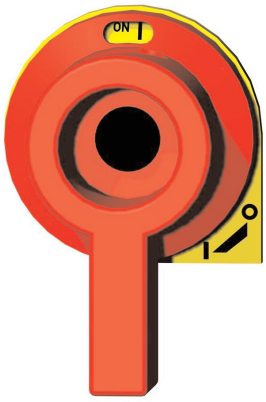
Screen	Function
Access code 756 required. SCREEN 44 (Alarm Screen) A 1 P3	This is the first Alarm History screen. In this section, the last 10 alarms that have occurred are saved, starting with the most recent alarm. The number in the setpoint screen shows the list of alarms 1-10. The alarm code shows up in the actual screen. Some of the alarm codes are shown on the display label. Please refer to the alarm section of this manual for all alarm code definitions.
A 2 A1 A 3 A5 A 4 A4 A 5 P1 A 6 P5 A 7 A7 A 8 A2 A 9 A6 A 10 P2	These are the additional alarm screens. See the explanation above.

Control Function Descriptions (continued)

Screen	Function
Screen 45-49 require access code 754.	
Central When supplied for central drying applications, these functions are not available.	
SCREEN 45 (Setback Temperature Enable Option) C off C11	This screen shows the setting of the setback option. It can be set to "Off" or "On". "Off" turns the setback mode off, and the dryer will not change the process setpoint. "On" tells the control the dryer should go into setback when the hopper outlet temperature reaches its setpoint (Menu number 6, Screen 10).
SCREEN 46 (Precooler Flow Control Enable Option) H off 13	This screen shows how the precooler flow control is set to operate. The precooler flow control option must be installed for this screen to appear. If this screen is set to "On", the control will assume the precooler is installed in the process line and will only allow setpoints from 100 - 150°F {38 - 66°C}. It will also assume the water flow solenoid valve is piped in the water line and the dryer control will regulate water flow to control temperature. ✎ **NOTE:** If this function is set to off, make sure the water to the precooler is turned off.
SCREEN 47 (Degree F/Degree C) C F C15	This is the temperature units screen. It is used to change the temperature display from °F to °C or °C to °F. Use the (+) or (-) keys to toggle between °C and °F.

(continued)

To Start Drying



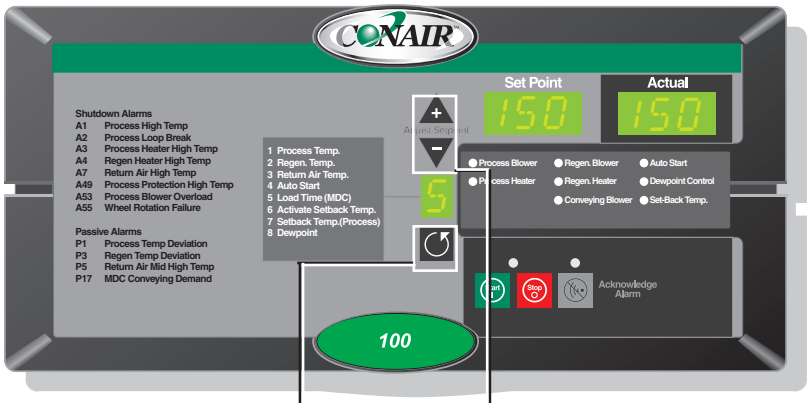
1 **Make sure there is material in the hopper.**

2 **Turn on the main power to the dryer.** Make sure the dryer's disconnect dial is in the ON position. This powers up the control and the display lights will illuminate.

3 **Set the drying temperature.** Use the Scroll button to get to the process temperature function. Press the Adjust Setpoint (+) or (-) buttons to select a drying temperature.

Central

When configured as a central dryer, the drying temperature can not be set since there is no process heater in the system.



Scroll Button

Setpoint Adjustment

(continued)

To Start Drying (continued)

4 Press the START button.

If everything is installed correctly:

- The green light on the start button will illuminate.
- The process and regeneration blowers turn on and the display LEDs will illuminate.
- The process and regeneration heaters turn on and the display LEDs will illuminate.
- The desiccant wheel starts turning.

Central

- The green light on the start button will illuminate.
- The process and regeneration blowers turn on and the display LEDs will illuminate.
- The regeneration heater turns on and the display LED will illuminate.
- The desiccant wheel starts turning.

To Stop Drying

1 Press the STOP button. The Stop LED blinks red.

- The blowers continue running for a few minute to cool the heaters.

2 Be sure to disconnect and lockout the main power if you have stopped the dryer to perform maintenance or repair.

IMPORTANT: Do not use the main power switch to stop the dryer. Turning off power to the control and dryer during normal operation prevents the necessary cool-down period, and can trigger the shutdown/high temperature alarm during your next drying cycle.

⚠ **CAUTION:** Improper shut down can cause damage to your dryer.

Using the Auto Start Countdown Function

The countdown function allows the user to set the Carousel Plus W Series Dryer to automatically start at a predetermined time. The countdown time can be set from 0.1 to 150.0 hours.

To set the countdown time:

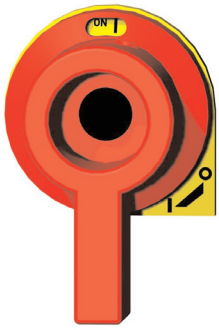
1 Use the Scroll button to access the function (Menu 4, Screen 8).

2 Use the Setpoint Adjust keys to set the desired countdown time, in hours.

3 Press the **"Start"** button. The Auto Start LED will blink to indicate that Auto Start is armed.

How to Disable the Auto Start on the DC-1 Control

To disable auto start once armed cycle the power off and on.



Central

When configured as a central dryer, the high setpoint limits can not be set since there is no process heater in the system.

NOTE: Conair is not responsible for damage caused by excessively high drying setpoints that are not in accordance with your drying material recommendations.

NOTE: Software may allow the process temperature setpoint limit up to 450°F {232°C}, however Conair does not recommend a setpoint limit over 375°F {191°C} due to nuisance alarms.

Setting the High Setpoint Limit

Using the high setpoint limit can protect your drying process from accidental or unauthorized settings above an acceptable level for the material you are drying.

1 **Turn on the main power to the dryer.**

2 **While at the default screen (Screen 5) press the scroll button and the setpoint (-) minus button simultaneously** to get to Screen 14**.**

0		0

3 **On screen 14 enter the password for set up screens (754)** using the setpoint (+) or (-) button.

0	754	0

4 **Scroll to screen 16.**

C	385	C02

This is your current high setpoint limit. Press (+) or (-) keys to set a new high setpoint limit.

Tip: We recommend that you set your high setpoint limit 10° higher than your maximum high temperature setpoint.

5 **To lock in your new high setpoint limit** and exit the password protected screens, scroll back to screen 14, then enter 500 and press scroll or cycle the power off and on.

0	754	0

Using Dewpoint Control

Dewpoint control is a feature that can help you to reduce energy consumption. It does this by varying the temperature of the regeneration air from its default setpoint of 350° F {177° C}, to maintain a setpoint that you have entered on the process dewpoint screen (Screen 11).

Example:

If your material is not difficult to dry, it may dry adequately with -20° F {-29° C} dewpoint air. When -20° F {-29° C} is entered as the setpoint (Screen 11), the dryer will gradually lower the regeneration air temperature to a point where the dryer's delivery air is controlled at -20° F {-29° C} dewpoint.

The dewpoint control is active with setpoint values of -39° F {-39.4° C} and higher. When the setpoint is -40° F {-40° C} or lower, the regeneration temperature will be maintained at the default temperature of 350° F {177° C} and the dewpoint control is inactive.

NOTE: For more information concerning specific dewpoint control screens, see Control Function Descriptions, page 4-5.

Using the Setback Feature (Optional)

The setback function available on the Carousel Plus W Series Dryer with DC-1 control is designed to save you money on energy costs and keep you from over drying your material.

Central

When supplied for central drying applications, the W series dryer is not equipped with a process heater. Therefore the setback function is not applicable.

The optional setback feature, if installed from the factory, is disabled and will need to be enabled in access code 754 (Screen 45).

This is how setback operates when installed and turned on:

The control monitors the temperature of the air exiting the drying hopper. If that temperature reaches a customer entered setpoint (Screen 10), the delivery process air temperature will automatically setback to a customer-entered setpoint (Screen 11). Then, if the air exiting the drying hopper drops below the customer-entered temperature on Screen 10 by an amount greater than what is shown on Screen 23, the process temperature will automatically reset back to the original process temperature (Screen 5).

To turn on and setup the setback option:

1. **Enter the access code 754 (see Screen 14). Then using the scroll buttons, scroll to menu Screen 45.**
2. **Turn the setback function for temperature option to "On" by pressing the (+) key.**
3. **Push the scroll button to return to access code 754, then change the code to 500.** Once the number has been entered push the scroll button or cycle the power to clear the access code.
4. **Go to Screen 10.** This is where you will set the temperature setpoint for the air at the outlet of the drying hopper.
5. **On Screen 11 set the temperature setpoint** to which the process air will revert to once the air at the outlet of the drying hopper has reached its setpoint.

✎ **NOTE:** Screen 5 will still show normal drying temperature as setpoint when setback is active.

(continued)

Using the Setback Feature (Optional) (continued)

6 **Use the setback temperature band screen (Screen 23) to set the amount the return air temperature has to drop** below the setpoint on Screen 10 before the original process temperature is restored. For example, if the activate setback temperature was 180ºF {82ºC} and the value on Screen 23 is set to 20, once the dryer moves into setback, the actual temperature measured at the outlet of the hopper would have to drop below 160ºF {71ºC} to restore the original process set point.

7 **When the "Setback" Feature is active, the Setback LED will be lit,** and the actual temperature on screen 5 will eventually approach the setpoint entered in screen 11.

Setback Feature Guidelines (Optional)

Careful selection of setpoint values in these functions is necessary for the setback to operate properly. The following table is only a guideline of recommended settings for these setpoints. It will be necessary for each customer to determine the best setpoints for their application based on experience.

Normal Drying Temp	Setback Return Temp Screen #10	Setback Temp (Process) Screen #11
160° F {71° C}	120° F {49° C}	150° F {66° C}
240° F {116° C}	135° F {57° C}	180° F {82° C}
300° F {149° C}	160° F {71° C}	200° F {93° C}
340° F {171° C}	180° F {82° C}	220° F {104° C}

To turn off the setback option:

1 **Enter the access code 754 (see Screen 14). Then using the scroll buttons, scroll to menu Screen 45.**

2 **Turn the setback function for temperature option to "Off"** by pressing the (-) key.

3 **Push the scroll button to return to access code 754, then change the code to 500.** Once the number has been entered push the scroll button or cycle the power to clear the access code.

Setback Feature Guidelines (Optional) (continued)

A recommended way to determine the "Setback Return Temperature" setpoint is to monitor the actual temperature of this function during pre-drying of your material at start-up, and while running at your normal maximum material throughput. The "Setback Return Temperature" setpoint should be set 10 to 20° above maximum temperature noted in these situations.

The "Setback Temperature (Process)" setpoint you select should be adequate to reduce the temperature significantly enough to prevent over-drying of your material. However, keep in mind that the cooler the temperature selected, the longer it will take for the material to heat back up to its proper drying temperature once the dryer comes out of Setback mode.

When drying at low temperatures (for example 160 - 180° F {71 - 82° C}), you are able to setback the temperature only a small amount. The "Setback Temperature (Process)" should not be set lower than 150° F {66° C}, even if the control will allow it. It is very likely the dryer will not be able to achieve low temperatures without adding additional cooling to the process air circuit. The maximum achievable setpoint is dependent on the temperature of the return air coming back to the dryer. As the return air temperature climbs, the temperature that the dryer is capable of controlling at climbs. For example, if the return air to the dryer is 110° F {43° C}, the dryer may not be able to control at a "Setback Temperature (Process)" setpoint below 150 - 155° F {66 - 68°C}.

NOTE: Selecting too low of a setpoint for Screen 26 may result in nuisance A2 Process Loop Break alarms if the dryer is not able to achieve this setpoint.

SECTION
5

Maintenance

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Preventative Maintenance Checklist

Routine maintenance will ensure optimum operation and performance of the Carousel Plus W Series Dryer. We recommend the following maintenance schedule and tasks.

• Whenever you change materials

❒ **Drain and clean the hopper.**

• Weekly, or as often as needed

❒ **Clean or replace the process and regeneration filters.**
You may need to clean filters more often than weekly. Frequency depends on how much material you process and how dusty or full of fines it is.

❒ **Inspect hoses and hose connections.**
Check for damage, kinks, or loose hose clamps. Replace any hoses that show signs of damage or wear. Reposition and tighten loose hose clamps.

• Monthly

❒ **Clean the aftercooler and/or optional precooler coils.**
You may need to clean the coils more often than monthly. Frequency will depend on the type and volume of material you process.

• Every six months

❒ **Inspect gaskets for damage or wear.**
Damaged gaskets can allow moisture to seep into the closed-loop drying system. Replace any gasket that is torn or cracked.

❒ **Verify dewpoint readout and performance with calibrated portable instrument.**

❒ **Measure current draw on all 3 legs of heater wires.** This is to ensure that the heater is working properly.

Checking the Dewpoint

It is a good idea to monitor the dewpoint performance of your dryer periodically with a calibrated portable dewpoint monitor, to ensure it is performing at maximum capacity. Even if your dryer has a dewpoint readout, comparing it to a portable instrument periodically will confirm that the dewpoint sensor and readout is performing properly.

To check dewpoint:

1. **Connect your portable dewpoint meter to the dewpoint check port of the dryer.**
2. **Turn on the portable instrument,** and ensure there is positive airflow through the sensor.
3. **Monitor the readout and allow ample time for it to stabilize before disconnecting the dewpoint monitor.** Some dewpoint monitors require a substantial amount of time for residual moisture to be purged from the sensor.
4. **In the event the dewpoint in not satisfactory,** refer to the *Troubleshooting section* of the manual, under A28 and P9 alarm for DC1.

Alternate Procedure: (for dryers with no dewpoint check port)

1. **Stop dryer and allow it to cool.**
2. **Remove the plastic cover of the dryer,** and locate the process heater tube.
3. **Connect a portable dewpoint instrument to the 1/8 inch NPT port at the process air outlet of the desiccant wheel assembly.** If there are existing connections for the dryer's dewpoint sensor, locate a 2nd 1/8 inch NPT port, or connect your dewpoint sensor in series with the dryer sensor. Do not install a tee to split the air between the dryer's sensor and your portable instrument. This may cause one of them to be starved for adequate sample air.
4. **Turn on the dryer.**

✎ **NOTE:** Portable dewpoint monitors purchased from Conair are provided with a male connector that plugs into the dewpoint check port. If you purchased your portable instrument elsewhere, the male connector is available through the Conair parts department.

✎ **NOTE:** The dewpoint check port was not included on the initial release of the Carousel Plus Dryers. It can be added easily. Contact the Conair parts department or follow the alternate procedure.

Replacement dewpoint monitors, male connectors and dewpoint check ports are available from Conair.

Contact Conair Parts
(800) 458 1960
From outside of the
United States, call:
(814) 437 6861

Checking the Dewpoint (continued)

5 **Turn on the portable instrument** and ensure there is positive airflow through the sensor.

6 **Monitor the readout and allow ample time for it to stabilize before disconnecting the portable instrument.** Some dewpoint monitors require a substantial amount of time for residual moisture to be purged from the sensor.

7 I**n the event the dewpoint is not satisfactory,** refer to the *Troubleshooting section* of the manual, under A28 and P9 alarm for DC1.

8 **Stop the dryer and allow it to cool down.** After the dryer has cooled, disconnect the portable instrument and replace any pipe plugs that may have been removed.

9 **Replace the plastic cover and start the dryer.**

Cleaning the Hopper

CAUTION: Hot surfaces. Always protect yourself from hot surfaces inside and outside the dryer and drying hopper.

The hopper, spreader cone, and discharge assembly should be cleaned thoroughly between material changes to prevent resin contamination.

1. **Close the hopper slide gate.**

2. **Disconnect the hoses and remove the distribution box under the hopper** and drain the remaining material into a bucket.

3. **Remove the spreader cone.** Open the hopper door. Reach into the hopper. Grasp the spreader cone tube, lift up slightly, twist and then push down to release it. Tilt the cone assembly and pull it out through the hopper door.

4. **Clean the spreader cone and the inside of the hopper.** Make sure you also clean the return air screen at the return air outlet of the hopper.

5. **Repeat the steps in reverse order** to reassemble the hopper before adding material.

Cleaning the Process Filter

Clogged filters reduce air flow and dryer efficiency. Cleaning frequency depends on how much material you process and how dusty or full of fines it is.

CAUTION: Hot Surfaces.

Always protect yourself from hot surfaces inside the dryer and hopper. Also exercise caution around exterior surfaces that may become hot during use. These include the hopper door frame, the exterior of an uninsulated hopper, the return air hose and the dryer's process filter housing and moisture exhaust outlet.

1. **To access the filter, push down and turn the top of the filter housing in a clockwise direction** to remove.

2. **Remove the filter cartridge from the filter housing.**

3. **Clean or replace the filter.**

CAUTION: Wear eye protection. If you use compressed air to clean the equipment, **you must wear eye protection** and observe all OSHA and other safety regulations pertaining to the use of compressed air.

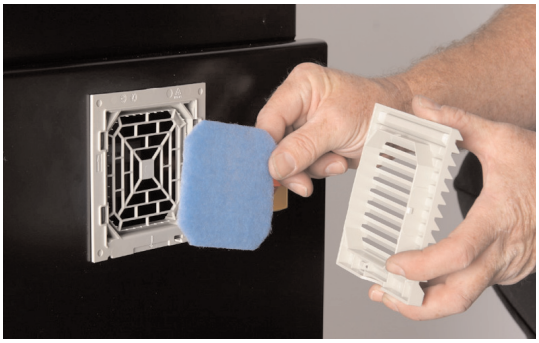
4. **Wipe the inside of the filter housing clean**, then replace the filter cartridge into the housing.

5. **Line up the slots in the top of the filter housing, push down and turn counterclockwise until locked into place.**

Cleaning the Regeneration Filter

Clogged filters reduce air flow and dryer efficiency. Cleaning frequency depends on how much material you process and how dusty it is.

1 **To access the regeneration filter, use a small flat screwdriver to gently pry down on the slot in the lower right hand corner of the filter grill while pulling out on the bottom.**



2 **Remove the filter from inside the grill** and clean with soap and water.

3 **Replace the filter in the grill** and snap the grill into place.

Cleaning the Aftercooler Coils

The aftercooler coils will need to be kept clean to keep the aftercooler working efficiently. Cleaning frequency depends on the type and amount of material you process.

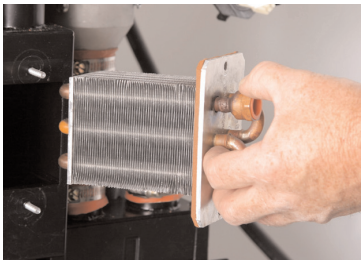
1 **Stop the dryer and lockout the main power.**

2 **Turn off the water flow to the water supply line.** Disconnect supply and return lines.

NOTE: If an optional flow control was added with the aftercooler, remove the compression fitting from the aftercooler inlet. Loosen the fitting on the flow control, then swing the copper water supply tube out and away from the aftercooler inlet.

3 **Remove the two (2) nuts securing the aftercooler** in the housing.

TIP: If the aftercooler (without a flow control) was installed using the recommended 24 inch {61 cm} of flexible hoses, there is no need to disconnect the hoses from the aftercooler inlet and outlet.



4 **Remove the aftercooler assembly** from the aftercooler housing.

5 **Clean the assembly using a mild soap and water.** Let the assembly dry thoroughly before installation.

6 **Inspect the condition of the gasket.** If it is damaged, replace the gasket.

7 **Reassemble** by repeating the steps in reverse order.

8 **Connect the water supply line to the inlet.** If a manual shut off valve is used, it should be mounted on the inlet line as well.

9 **Connect the outlet of the aftercooler to the inlet of the flow control valve** using the pre-shaped copper tubing and compression fittings provided.

Cleaning the Precooler Coils

If you have the optional precooler, you need to clean the cooling coils to keep them working efficiently. See Appendix B for details.

Inspecting Hoses and Gaskets

Loose or damaged hoses and gaskets can allow moisture to seep into the closed-loop drying system.

1. **Follow the hose routing of all the hoses within the dryer and inspect all hoses, clamps, fittings, and gaskets.**
2. **Tighten any loose hose clamps or fittings.**
3. **Replace worn or damaged hoses and gaskets.**

SECTION
6

Troubleshooting

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Before Beginning

You can avoid most problems by following the recommended installation and maintenance procedures outlined in this User Guide. If you do have a problem, this section will help you determine what caused it and how to fix it.

✎ **NOTE:** Use of test mode screens 28-43 may assist with the determining of possible cause of an alarm. Access code 756.

Before you remove the cover from the dryer be sure to:

❑ **Diagnose causes from the control panel.**

1 **Press** **once to silence the optional audible alarm and display the alarm message.**

2 **Address the alarm message and fix the problem.** (Refer to the alarm descriptions later in this section.)

3 **Press** **again to clear the alarm. If the alarm reappears the problem was not fixed.**

Before Beginning (continued)

❑ **Find the wiring and equipment diagrams that were shipped with your dryer.** These diagrams are the best reference for correcting a problem. The diagrams also will note any custom features, such as special wiring or alarm capabilities, not covered in this User Guide.

See warnings below. Open the electrical enclosure to check fuses and heater contactors.

A Few Words of Caution

The Carousel Plus W Series Dryer is equipped with numerous safety devices. Do not remove or disable them. Improper corrective action can lead to hazardous conditions and should never be attempted to sustain production.

WARNING: Only qualified service personnel should examine and correct problems that require opening the dryer's electrical enclosure or using electrical wires to diagnose the cause.

WARNING: High voltage. Always stop the Carousel Plus dryer, disconnect and lock out the main power source before troubleshooting or performing repairs.

CAUTION: Hot surfaces. Always protect yourself from hot surfaces inside and outside of the dryer and hopper.

How to Identify the Cause of a Problem

✎ **NOTE:** Pushing the Acknowledge Alarm button when there is no active alarm will display the most recent alarm code.

✎ **NOTE:** The dryer cannot be started if a passive alarm is present on power-up.

Dryer alarms are indicated by an illuminated Acknowledge Alarm light on the Carousel Plus W Series Dryer control panel. Shutdown alarms will energize optional audible and visual alarm indicators.

A problem can trigger two types of alarms:

- **Shutdown:** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive:** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

When the alarm light is displayed:

1. **Press the Acknowledge Alarm button once to silence the optional audible alarm and display the alarm message.** Pressing the Acknowledge Alarm button once also changes the alarm LED from blinking to solid.
2. **Find the error message in the diagnostics table** of this *Troubleshooting section*. Use information provided to diagnose and resolve the cause of the alarm.
3. **Note that, after correcting the problem, pressing the Acknowledge Alarm button a second time will clear the alarm.** If the alarm reappears, the cause has not been resolved.

✎ **NOTE:** When the dryer detects abnormally high temperature in the process heater, the dryer immediately shuts down and an error message appears in the display window.

Central

When supplied for central drying applications, these shutdown alarms are not available.

Alarms

A problem can trigger two types of alarms:

- **Shutdown (A#):** If the red Acknowledge Alarm LED is blinking, the alarm is a shutdown alarm. The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer. Note that once the Acknowledge Alarm button is pressed once, the blinking red LED becomes solid.
- **Passive (P#):** If the amber Acknowledge Alarm LED is blinking, the alarm is a passive alarm. The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer. Note that once the Acknowledge Alarm button is pressed once, the blinking amber LED becomes solid.

Problem	Possible cause	Solution
A1 - Process High Temperature – If the process temperature exceeds the process high temperature setpoint, it shuts down the dryer. Defaults are set to 385°F {196°C} for 20 seconds.	The process high temperature setpoint is not at least 10°F {6°C} above the drying setpoint.	Reset the process high temperature setpoint at least 10°F {6°C} above the drying setpoint.
	One of the process solid state relays has failed.	Replace the solid state relay.
	The air lines are restricted or loose.	Straighten any crimps in the hoses. Tighten any loose hoses.
	The process setpoint is too low.	Set the process setpoint higher or install an optional precooler.
	The process heater output on the control board has failed.	Replace the control board.

Alarms

Central

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

When supplied for central drying applications, these shutdown alarms are not available.

Problem	Possible cause	Solution
A2 - Process Temperature Loop Break – If the process temperature is outside of the operator entered deviation, alarm band (see Process High Temperature Deviation passive alarm) and the process temperature is not moving towards the setpoint at a rate greater than specified, it shuts down the dryer. Defaults are set at 3°F {2°C} over 20 seconds.	Process RTD is loose or has fallen out.	Check the process RTD and tighten if needed.
	The process heater has failed.	Check the heater fuses, and resistance across each leg of the process heater.
	The air lines are restricted or loose.	Straighten any crimps in the hoses. Tighten any loose hoses.
	The process blower is not running or is running in the wrong direction.	Correct the cause of the non-running blower or reverse the rotation of the blower. *See Installation section entitled, Checking for proper air flow.*
	The process heater output on the board has failed or the output fuse has failed.	Replace the board or the fuse for the output.
	Process setpoint is set too low.	Adjust to higher setting or add a precooler.
	Setback setpoint is set too low.	Adjust to higher setting or add a precooler.
A3 - Process Heater High Temperature – The snap switch in the process heater tube opens due to excessive temperature	There is an air flow blockage or loose hoses.	Locate and remove any airflow restrictions.
		Tighten any loose hoses.
	The process blower is not running or running in the wrong direction.	Correct the cause of the non-running blower (blown fuse, etc.) or reverse the rotation of the blower. *See Installation section entitled, Checking for proper air flow.*

Alarms

Central

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

When supplied for central drying applications, these shutdown alarms are not available.

Problem	Possible cause	Solution
A3 - Process Heater High Temperature (cont.)– The snap switch in the process heater tube opens due to excessive temperature.	The isolation contactor failed in the closed position.	Replace the isolation contactor.
	The process heater output on the board has failed.	Replace the board.
	The heater solid state relays (SSRs) failed.	Replace the failed heater solid state relays (SSRs).
A4 - Regeneration Heater High Temperature – The snap switch in the regeneration heater tube activated due to excessive temperature.	The regeneration exhaust is blocked or the air hoses are loose.	Locate and remove any airflow restrictions. Tighten hoses.
	The regeneration blower is not running or is running in the wrong direction.	Correct the cause of the non-running blower (blown fuses, etc.) or reverse the rotation of the blower. *See Installation section entitled, Checking for proper air flow.*
	The isolation contactor failed in the closed position.	Replace the isolation contactor.
	The heater solid state relays (SSRs) failed.	Replace the failed heater solid state relays (SSRs).
	The regeneration heater output on the board has failed.	Replace the board.
A7 - Return Air High Temperature – If the return air temperature at the inlet to the blower is greater than 180°F {82°C}, it shuts down the dryer.	The hopper does not contain enough material.	Make sure your material supply system is working properly.
	You are drying at a high drying temperature above 240°F {116°C} or you are running at low throughputs.	Ensure water flow to the aftercooler.

Alarms

Central

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

When supplied for central drying applications, these shutdown alarms are not available.

Problem	Possible cause	Solution
A7 - Return Air High Temperature (cont.) – If the return air temperature at the inlet to the blower is greater than 180°F {82°C}, it will shut the dryer down.	The aftercooler does not have enough water.	Turn on the water supply, or fix any leaks or blockages.
	The aftercooler coils are dirty.	Clean the aftercooler coils. *See Maintenance section entitled, Cleaning the aftercooler coils.*
A10 & P26 - Process RTD Integrity – If the process RTD is faulty, it shuts down the dryer.	The process RTD connection to the control box is loose.	Check the connection to the receptacle and tighten if needed.
	The connection in the electrical enclosure for the process RTD is loose.	Check the RTD plug connection and tighten if needed.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The process RTD has failed.	Replace the process RTD.
	The control board has failed.	Replace the control board.
A21 & P1 - Process Temperature Deviation – The process temperature exceeds the deviation band as entered for the specified time. Default values are 10°F {6°C} for 5 seconds.	One of the solid state relays (SSRs) failed.	Replace the failed solid state relays (SSRs).
	Process heater has failed.	Check heater fuses and resistance across each leg of heater.
	The output on the board has failed.	Replace the board.
	The process RTD is loose or has fallen out.	Check the process RTD and tighten if needed.
	The air hose connections are loose.	Tighten all air hose connections.

Alarms

Central

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

When supplied for central drying applications, these shutdown alarms are not available.

Problem	Possible cause	Solution
A22 & P2 - Process Low Temperature – The process temperature is less than the low temperature setpoint for the specified time. Default values are 70°F {21°C} for 20 seconds.	Precooler water is too cold, or the water flow rate is too high.	Check water temperature and flow settings. Adjust as necessary.
	The output on the board has failed.	Replace the board.
	Flow control solenoid is stuck open.	Replace the valve.
	The process RTD is loose or has fallen out.	Check the process RTD and tighten if needed.
	Process heater has failed.	Check the heater fuses and resistance across each leg of the process heater.
A23 & P3 - Regeneration Temperature Deviation – The regeneration temperature exceeds the deviation band for the specified time. Default values are 10°F {6°C} for 5 seconds.	One of the solid state relays (SSRs) failed.	Replace the failed solid state relays (SSRs).
	The regeneration RTD is loose or has fallen out.	Check the regeneration RTD and tighten if needed.
	The air hose connections are loose.	Tighten all air hose connections.
	The output on the board has failed.	Replace the board.
	Defective heater.	Check the heater fuses and resistance across each leg of the regeneration heater.

Alarms

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Problem	Possible cause	Solution
A25 & P5 - Return Air Mid-High Temperature – If the return air temperature is between 150 and 180°F {66 and 82°C}.	The hopper does not contain enough material.	Make sure your material supply system is working properly.
	You are drying at a high drying temperature above 240°F {116°C} or running at low throughputs.	Ensure water flow to the aftercooler.
	The aftercooler does not have enough water.	Turn on the water supply, or fix any leaks or blockages.
	The aftercooler coils are dirty.	Clean the aftercooler coils. *See Maintenance section entitled, Cleaning the aftercooler coils.*
A26 & P6 - Regeneration High Temperature – If the regeneration temperature exceeds the high temperature limit for the specified time. Default values are 400°F {204°C} for 20 seconds.	One of the solid state relays (SSRs) failed in the closed position.	Replace the failed solid state relays (SSRs).
	The output on the board has failed.	Replace the board.
A27 & P7 - Regeneration Low Temperature – The regeneration temperature is less than the low temperature setpoint for the specified time. Defaults are 200°F {93°C} for 20 seconds.	The regeneration heater has failed.	Check the heater fuses and resistance across each leg of the process heater.
	The output on the control board has failed or the fuse has blown.	Replace the control board or the fuse.
	The regeneration RTD is loose or has fallen out.	Check the regeneration RTD and tighten if needed.

Alarms

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Problem	Possible cause	Solution
A28 & P9 - Process dewpoint – The dewpoint has not fallen below the setpoint. If the dewpoint goes below the setpoint for 180 seconds the alarm should go away. **NOTE:** The alarm is not active for the first 5 minutes.	Defective sensor.	Replace the sensor.
	The hose or wiring connections to the sensor block are loose or have fallen off.	Check wiring and hose connections to the sensor, resecure if needed.
	Poor regeneration air flow.	Remove any air flow restrictions, dirty filters, kinked hoses, etc.
	The desiccant wheel may be contaminated.	Check the desiccant for contamination, replace if needed. Replace the desiccant wheel. *See Troubleshooting section, entitled Replacing the desiccant wheel.* Install plasticizer/volatile trap for severe situations.
	Desiccant wheel not turning.	*See A55 & P31*
	Leaks in the process air stream.	Check for worn or lose hoses. Replace as needed.
A29 & P10 - Process Filter Clogged (Option) – The process filter differential pressure switch is tripped.	The process air filter is clogged.	Remove and clean or replace the process air filter.

Alarms

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Problem	Possible cause	Solution
A33 & P26 - Regeneration RTD Integrity – If the regeneration RTD is faulty, it shuts down the dryer.	There is a loose connection in the wiring leading to the RTD.	Check the RTD plug connections, make necessary repairs.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The regeneration RTD has failed.	Replace the regeneration RTD.
	The control board has failed.	Replace the control board.
A34 & P28 - Return Air Temperature RTD Integrity – The dryer continues to run with a passive alarm.	There is a loose connection in the wiring leading to the RTD.	Check the RTD plug connections, make necessary repairs.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The return air RTD has failed.	Replace the return air RTD.
	The control board has failed.	Replace the control board.
A35 & P8 - Regeneration Temperature Loop Break – The regeneration temperature is outside of the operator entered deviation alarm band (see Regeneration Temperature Deviation passive alarm) and the regeneration temperature is not moving towards the setpoint at a rate greater than specified. Default values are 2°F {1°C} over 40 seconds.	The regeneration heater has failed.	Check the heater fuses, and resistance across each leg of the process heater.
	The regeneration RTD is loose or has fallen out.	Check the regeneration RTD and tighten if needed.
	The regeneration blower is not running.	Correct the cause of the non-functioning blower. *See Installation section entitled, Checking for proper air flow.*
	The output on the control board has failed or the fuse is blown.	Replace the control board or fuse.

Alarms

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Problem	Possible cause	Solution
A36 -Control Communications Watchdog - The display board has lost communications with the control board.	Plugs on wire harness between the display and control boards are loose or not wired correctly.	Make sure plugs are tight on board connections and match the wiring diagram.
	Display board or control board has failed.	Replace the defective boards.
A38 - Phase Error (Phase Option) - One of the three power wires is connected wrong, or one or more phases of power is missing.	One of the three power wires are out of phase.	Switch the position of two of the incoming lead power wires at the dryer.
	A fuse has blown.	Check and/or replace the fuse.
	Phase detection board has failed.	Replace the phase detection board.
	Loose wire connection between phase board and control board.	Make sure wires are correct and secure.
A39 - EEProm Write Error	Internal control board problem.	Replace the control board.
A41 & P30 - Setback RTD Integrity	The connection in the electrical enclosure for the hopper RTD is loose.	Check the RTD plug connection and tighten if needed.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The setback RTD has failed.	Replace the setback RTD.
	The control board has failed.	Replace the control board.
	The setback RTD connection to the control box is loose.	Check the connection to the receptacle and tighten if needed.

Alarms

Central

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

When supplied for central drying applications, these shutdown alarms are not available.

Problem	Possible cause	Solution
A49 - Process Protection High Temperature – If the process protection temperature exceeds the process protection high temperature setpoint, it shuts down the dryer. Defaults are set to 600°F {316°C} for 10 seconds.	The process RTD temperature probe is not installed correctly.	Make sure the RTD temperature probe tip is in the center of the hopper inlet tube.
	The process blower is not running.	Correct the cause of the non-functioning blower.
	The air lines between dryer and hopper are restricted or loose.	Straighten any crimps in the hoses. Tighten any loose hoses.
	The dryer is too far from the hopper.	Move the dryer closer to the hopper and shorten the hoses.
	The process hose is not insulated.	Insulated hose is required for high drying temperatures.

Alarms

Central

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

When supplied for central drying applications, these shutdown alarms are not available.

Problem	Possible cause	Solution
A50 - Process Protection Differential - If the difference between the process temperature exiting the process heater and the temperature of the air entering the hopper is greater than 175°F {97°C} for longer than 180 seconds it shuts down the dryer.	The air lines between dryer and hopper are restricted or loose.	Check for air flow blockages or loose hoses between the outlet of the dryer and the inlet of the hopper. Straighten any crimps in the hoses. Tighten any loose hoses.
	The dryer is located too far away from the hopper.	The dryer and the hopper should not be located more than 10 feet {3.05 m} apart.
	The process RTD is loose or has fallen out.	Check the process RTD and tighten if needed.
	The process blower is not running.	Correct the cause of the non-functioning blower.
	The process hose is not insulated.	Insulated hose is required for high drying temperatures.
A51 & P29 - Process Protection RTD Integrity – If the process protection RTD is faulty, it shuts down the dryer.	There is a loose connection in the wiring leading to the RTD.	Check the RTD plug connections, make necessary repairs.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The process protection RTD has failed.	Replace the process protection RTD.
	The control board has failed.	Replace the control board.

Alarms

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Problem	Possible cause	Solution
A53 - Process Blower Overload - If the process blower exceeds its full load amp rating or the overload has tripped due to a mechanical or electrical problem the dryer will shut down. ✎ **NOTE:** Once the overload has tripped you must wait 2 - 15 minutes with power on for it to automatically reset.	The process blower current draw has exceeded the full load amps rating of the motor.	Press alarm acknowledge and allow overload to automatically reset, then try to restart the dry. If the alarm condition occurs again have a qualified electrician check the current draw to the motor.
	The process blower has mechanically failed or is unable to rotate freely.	Disconnect and lock out main power. Check the process blower for mechanical failure and free rotation. Replace if necessary. Allow overload to automatically reset, then try to restart the dryer.
	The process blower has failed electrically.	Disconnect and lock out main power. Check the process blower for electrical shorts or open circuits. Replace if necessary. Allow overload to automatically reset, then try to restart the dryer.
	Loss of phase of power to the motor starter.	Check for a blown fuse in the dryer or main power supply. Allow overload to automatically reset, then try to restart the dryer.
	The overload is set incorrectly.	Disconnect and lock out main power. Check the overload settings and confirm that the settings match the full load amps listed on the process blower motor. Allow overload to automatically reset, then try to restart the dryer.
	Overload is defective.	Replace the overload.

Alarms

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Problem	Possible cause	Solution
A55 & P31 - Wheel Rotation Failure - The regeneration temperature differential has been reached.	The wheel motor is not turning.	Check the motor, plugs and fuses.
	The belt tensioner is loose or the belt is slipping.	Change the tensioner spring or replace the belt.
	The regeneration heater is not working.	Check the heater fuses and heater.
A56 & P32 - Regeneration Outlet RTD Integrity - The control can not sense the regeneration outlet RTD.	There is a loose connection in the wiring leading to the RTD.	Check the RTD plug connection, make necessary repairs.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The regeneration outlet RTD has failed.	Replace the regeneration outlet RTD.
	The control board has failed.	Replace the control board.

Alarms

- **Shutdown (A#):** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.
- **Passive (P#):** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Problem	Possible cause	Solution
P34 - Dewpoint Deviation High – Displayed when the actual dewpoint goes above the setpoint by a specified amount of time and degrees. Defaults are set for 5°F {3°C} for 30 seconds.	The hose or wiring connections to the sensor block are loose or have fallen off.	Check wiring and hose connections to the sensor, resecure if needed.
	Poor regeneration air flow.	Remove the air flow restrictions, clean or replace dirty filters, etc.
	Desiccant wheel not turning.	*See A55 & P31*
	The desiccant wheel may be contaminated.	Check the desiccant for contamination, replace if needed.
		Replace the desiccant wheel. *See Troubleshooting section, entitled Replacing the desiccant wheel.*
		Install plasticizer/volatile trap for severe situations.
	Leaks in the process air stream.	Check for worn or loose hoses.
P35 - Dewpoint Deviation Low – Displayed when the actual dewpoint goes below the setpoint by a specified amount of time and degrees. Defaults are set for 5°F {3°C} for 30 seconds.	The dewpoint can not control to the desired setpoint.	Material and/or ambient condition may be too dry to increase the actual dewpoint. Please wait several hours to determine if the setpoint can be reached. Increase the dewpoint low deviation value.
	The dewpoint sensor has failed.	Replace the dewpoint sensor.

Additional Alarms

Along with the alarm indicators, you may encounter additional messages that indicate a problem within the control.

Problem	Possible cause	Solution
CoS Er.4 or Co5 Er. 4 - Displayed when the **"Start"** button is pushed during any active alarm. (Passive or Shutdown)	The dryer will continue to run if there is a passive alarm, however it will not start if there is a active alarm.	Push the alarm acknowledge button to identify the alarm, and address it as necessary.
CoS Er.0 or Co5 Er.0 - Indicates there is a problem in the communication between the control board and the display board.	Loose or improperly connected wire.	Check wiring between control board and display board.
	Improper dip switch setup on control board.	Check dip switch setup on control board.
	Defective display board or control board.	Replace boards in sets to maintain software compatibility.
Err 004 - Indicates a mismatch of software between the display board and the control board.	The software revision of the display board and control board are not compatible.	In most cases, both display and control boards will need to be replace as a set.
Er. L - There is a problem in the sensor connection (RTD, dewpoint sensor, etc.) for the affected function.	Problem in the analog input section of the control.	Check that all jumpers are in their proper place. Check to see if the dewpoint sensor is connected properly. Disconnect the ribbon cable connecting any analog option boards to the main control board. If the display returns to normal for all values except those that are generated through the analog options boards, replace the option board.

Additional Alarms

Along with the alarm indicators, you may encounter additional messages that indicate a problem within the control.

Problem	Possible cause	Solution
Er. H - There is a problem in the analog input section of the control.	Defect in the main control board.	Replace main control board.
	RTD is not connected properly or is defective.	Check RTD connections, replace defective RTD
	Connector to all RTDs is removed.	
	The ribbon cable between an analog option board and the main control board is not connected properly.	Check connections between analog option board and the main control board.
	Problem in the analog input section of the control.	Disconnect the ribbon cable connecting any analog option boards to the main control board. If the display returns to normal for all values except those that are generated through the analog options boards, replace the option board.
	Defect in the main control board.	Replace main control board.

Dewpoint Troubleshooting

Under normal operating conditions, the dryer will produce dewpoints in the range of -40 to -20° F {-40 to -29° C}. However, you may experience situations that produce undesirable results.

Problem	Possible cause	Solution
Dryer not producing desired dewpoint.	Return air temperature exceeds 125°F {52°C}.	Reduce the temperature of the cooling water or increase the flow.
	Regeneration temperature is below normal setting.	Check amperage of regeneration heaters. Replace heaters if necessary. ⚠ **WARNING:** Any electrical checks should be performed by a qualified electrician.
	Low regeneration air flow.	Check regeneration filter and clean and/or replace as necessary.
	Leaks in process lines.	Check all hoses, gaskets, doors, loaders or other potential areas where leakage may occur. Replace any defective hoses or gaskets.
	Contaminated desiccant due to off-gassing, too long of a residence time or drying temperature is too high for the grade of material being processed.	Verify proper drying temperatures and residence times. If off-gassing is a condition of the material being processed, contact Conair Parts at (800) 458 1960 for the addition of a volatile trap.
	Analog option board/sensor malfunction	Verify dryer dewpoint readings with a calibrated portable dewpoint meter. Replace analog option board or sensor.

Poor Material Drying Troubleshooting

Occasionally, processing problems that are suspected of being caused by poor drying are eventually determined to be the result of other issues in the process setup. The intent of the information provided here is to assist you in determining if your drying system is performing properly. However, the only way to know definitely if your material is properly dried is to perform moisture analysis of small samples as it leaves the bottom of the hopper, or just as it enters the process. Conair does not sell moisture-analyzing equipment, but there are many brands of this equipment available on the market.

You should also be aware that some processing problems may actually be the result of over drying material. Most materials will degrade to some extent if they are exposed to their specified drying temperature for a time significantly longer than the residence time specified by the supplier. If you want to maintain its dryness, it is recommended that you reduce the process air temperature. If your Conair dryer is equipped with the Setback feature, you should familiarize yourself with it, and make use of it. If not, you may want to contact Conair to determine if it can be added to your dryer.

A majority of customer questions to Conair are related to dewpoint. It is important to realize that dewpoint is one of **four** requirements that need to be satisfied.

There are four requirements, listed in order of importance, necessary to properly dry hygroscopic plastic resins:

1. **Drying temperature** of the air entering the hopper must be at the proper drying temperature for your material, as specified by your material supplier.
2. **Residence time** is the time, determined by your material supplier, that the material in use must be heated to achieve proper drying temperature.
3. **Airflow** during the process drying circuit must be adequate to carry and distribute the heat throughout the entire bed of material inside the hopper.
4. **Dewpoint** of the process air must be low so it can efficiently collect the moisture as it is released from the heated material and carry it to the dryer to be removed in the desiccant.

Poor Material Drying Troubleshooting (continued)

Once it is determined which of the four requirements that is not being satisfied, refer to the following list and possible causes and solutions.

Temperature - The temperature of the air entering the hopper must be at the proper drying temperature for your material, as specified by your supplier.

Problem	Possible cause	Solution
The temperature of the air entering the hopper is not at proper drying temperature.	Incorrect setpoint	Refer to the drying specifications for your material and adjust the setpoint to the recommended setpoint. If your dryer has the Setback option, make sure it is not active unless you have specifically activated it. If necessary, refer to the *Operation section* of this manual for assistance in using the Setback function.
	Not able to achieve setpoint.	Replace any defective process heater, contactors, fuses, etc. Ensure the selected drying temperature is within the design specifications of your dryer.
	Inaccurate process temperature readout.	Ensure the Process RTD is properly positioned in the air stream. Determine if there is a problem in the temperature control circuit and repair or replace any defective components such as RTD, temperature control, circuit boards, etc.

Poor Material Drying Troubleshooting (continued)

Residence Time - The time your material supplier has determined that the material in use must be heated to its drying temperature to achieve proper drying.

Problem	Possible cause	Solution
Material residence time is too long or short.	Material level in hopper is too low.	Make sure there is an adequate supply of material to feed the loader on top of the drying hopper. Correct any problems with the conveying system that may be preventing your loader from filling the hopper. If your hopper has a level sensor for maintaining a material level less than completely full, be sure this sensor is adjusted properly.
	Material throughput is too high.	Take any necessary steps, such as slowing down the process, to ensure the material usage is within design specifications of the dryer and hopper.

Poor Material Drying Troubleshooting (continued)

Airflow - The airflow in the process drying circuit must be adequate to carry and distribute the heat throughout the entire bed of material inside the hopper. If the airflow is too low, the material in the center of the hopper may get heated fully to the drying temperature, but the material against the sidewalls will not. In most cases, the material 2/3 to 3/4 of the way toward the top of the hopper should be heated to the proper drying temperature.

Problem	Possible cause	Solution
Too much or too little airflow. ✎ **NOTE:** If there is too much airflow, the material may fluidize inside the hopper, resulting in inconsistent material flow through the hopper, which can negatively impact residence time.	Dirty process air filter.	Clean or replace the process filter.
	Collapsed hoses or holes/leaks in the hoses and hose connections.	Replace any worn or damaged hoses. Tighten all hose clamps to eliminate leaks.
	Airflow restrictions.	Remove any obstructions in the process air circuit.
	Process blower running backwards or performing poorly.	Verify the process blower is running in the correct direction. If backwards, reverse direction by switching any 2 legs of high voltage to the motor. ⚠ **WARNING:** Any electrical checks should be performed by a qualified electrician. Repair or replace motor.
	Material level in the hopper too low.	Other than running out of material to complete a job, the material level inside the hopper must be a minimum of 50% full. If the hopper is not at least half full, the material in the cone section will not get adequate airflow to dry properly.

Poor Material Drying Troubleshooting (continued)

Replacement dewpoint monitors are available from Conair.

Contact Conair Parts
(800) 458 1960
From outside of the United States, call:
(814) 437 6861

Dewpoint - The process air must be at a low dewpoint so it can efficiently collect the moisture as it is released from the heated material and carry it to the dryer to be removed in the desiccant. In most cases, the dryer will dry your material satisfactory if the dewpoint of the air is -20 to -40° F {-29 to -40° C}. If your dryer does not have a dewpoint readout, you can check the dewpoint with a portable dewpoint instrument. Conair sells a variety of portable dewpoint meters. Contact Conair Parts.

Problem	Possible cause	Solution
Dryer dewpoint is not reaching proper setpoint.	Low regeneration temperature.	Replace or check defective heaters, fuses etc.
	Poor regeneration airflow.	Clean or replace the regeneration filter.
		Ensure the regeneration blower is operating properly and rotating in the correct direction. *See Installation section entitled, Checking for proper air flow.*
		Remove obstructions in the air stream, such as crimped hoses, etc.
	High dewpoint, ambient air leaking into the closed loop drying circuit.	Replace damaged hoses and seal any leaks in the process air circuit.
		If using a vacuum loader on the hopper, ensure that the loader shroud is installed in the hopper and that the hopper is completely filled with material.
		If partially filling your hopper, ensure that the hopper loader is sealed against ambient air.
		Install a gasket between the loader and the top of the hopper.
	Return air temperature to the dryer is too high.	Clean the aftercooler coils. *See Maintenance section entitled, Cleaning the aftercooler coils.*
	Poor desiccant performance.	*See Troubleshooting section, entitled Replacing the desiccant wheel assembly.*

Replacing Fuses

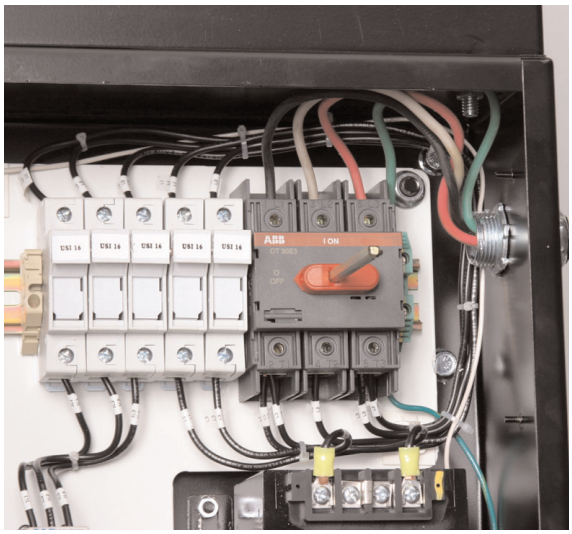
1 **Disconnect and lockout the main power supply.**

2 **Open the electrical enclosure door.**

3 **Check the fuse.** If necessary, pull the fuse out and replace it with a fuse of the same type and rating.

Fuse Blocks

To locate the appropriate fuse and replacement part, refer to the wiring diagrams that came with your dryer.



IMPORTANT: Always refer to the wiring diagrams that came with your dryer to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.

Checking Heater Solid State Relays

1 **Disconnect and lockout the main power supply.**

2 **Open the electrical enclosure.**

3 **Locate the process or regeneration relays.** Refer to the wiring diagrams that came with your dryer.

4 **Check continuity using an ohmmeter.**

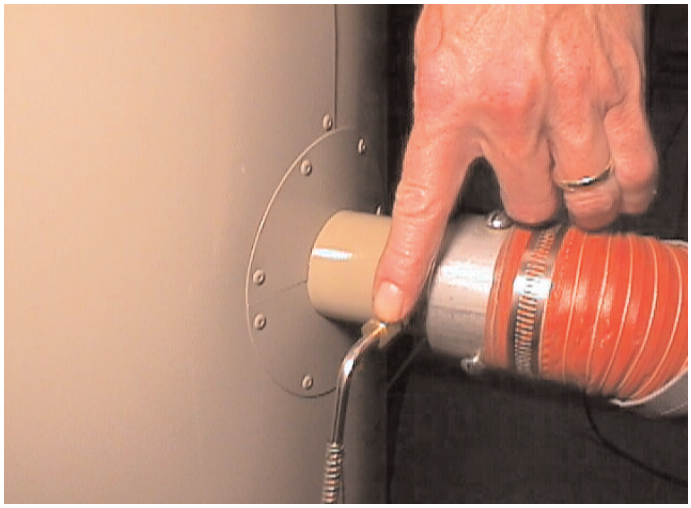
IMPORTANT: Always refer to the wiring diagrams that came with your dryer to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.

Regeneration heater solid state relays
If ohms equal zero or infinity, replace the relays.

Process heater solid state relays
If ohms equal zero or infinity, replace the relays.

Checking or Replacing Temperature Sensors

The Carousel Plus W Series Dryer uses RTD sensors to monitor the temperatures of the drying air, the return air, the regeneration outlet, and the regeneration and process protection and setback at the outlet heater of the hopper.



Location of the Process RTD at the Hopper inlet.

IMPORTANT: Always refer to the wiring diagrams that came with your dryer to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.

To check or replace RTD sensors:

1 **Disconnect and lockout the main power supply.**

2 **Remove dryer cover, as necessary.**

3 **Locate the RTD sensors.**

4 **Check the sensor positions and conditions.** Temperature readings will be incorrect, if the sensors are touching the wall of an air hose or pipe or if the sensor or wiring is damaged. The tip of the sensor should be centered within the air hose or pipe. Sensor wires should be attached to the appropriate connection points on the dryer's electrical enclosure or microprocessor board.

5 **To check with ohm meter,** measure the resistance across the RTDs. The resistance should be approximately 110 ohm at room temperature.

6 **Replace the sensor, if necessary.**

Replacing the Heaters

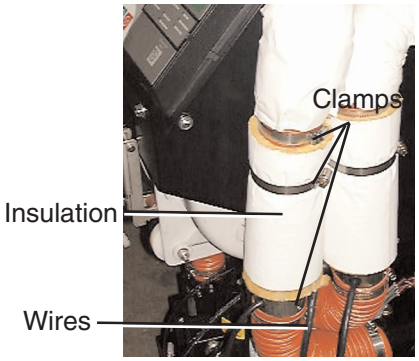
Regeneration Heater Tube

1 **Stop the dryer, disconnect the power, and follow proper lockout procedures.**

2 **Remove the plastic cover**.

3 **Disconnect the wiring harnesses of the defective regeneration heater. Then disconnect the hoses** from the top and bottom of the heater tube.

4 **Remove the clamp securing the heater tube in place** then remove the heater tube from the dryer.



5 **Cut the insulation in a straight line from end to end** then remove it from the old heater tube.

6 **Compare the markings on the outside of the regeneration heater tube** to ensure the new one has the same voltage and kW ratings as the original heater tube.

7 **Put the insulation on the new heater tube.** Use duct tape to hold the seam together.

8 **Secure the new heater tube** using the hose clamp removed in Step 4.

9 **Connect the hoses to the top and the bottom** of the regeneration heater tube.

(continued)

Replacing the Heaters

Regeneration Heater Tube (continued)

10 **Connect the wiring harnesses from the regeneration heater tube to the existing harnesses** from the control box.

11 **Replace the plastic cover.**

12 **Make sure the regeneration heater fuses are not blown before applying power to the new heater.**

Replacing the Heaters

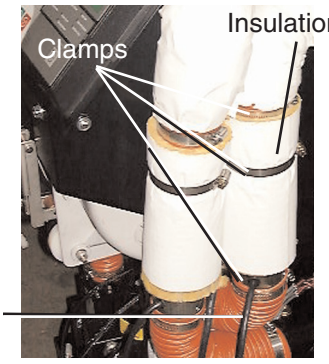
Process Heater Tube

Central

When configured as a central dryer, there is no process heater in the system. Therefore, replacing the process heater is not applicable.

1 **Stop the dryer, disconnect the power, and follow proper lockout procedures.**

2 **Remove the plastic cover.**



3 **Disconnect the wiring harnesses of the defective process heater. Then disconnect the hoses** from the top and bottom of the heater tube.

4 **Remove the clamp securing the heater tube in place** then remove the heater tube from the dryer.

5 **Cut the insulation in a straight line from end to end** then remove it from the old heater tube.

6 **Compare the markings on the outside of the process heater tube** to ensure the new one has the same voltage and kW ratings as the original heater tube.

7 **Put the insulation on the new heater tube.** Use duct tape to hold the seam together.

8 **Secure the new heater tube** using the hose clamp removed in Step 4.

9 **Connect the hoses to the top and the bottom** of the process heater tube.

continued

Replacing the Heaters

Process Heater Tube (continued)

10 **Connect the wiring harnesses from the process heater tube to the existing harnesses** from the control box.

11 **Replace the plastic cover.**

12 **Make sure the process heater fuses are not blown before applying power to the new heater.**

Central

When configured as a central dryer, there is no process heater in the system. Therefore, replacing the process heater is not applicable.

Replacing the Desiccant Wheel Assembly

When desiccant becomes clogged or contaminated, you should replace the desiccant wheel assembly to ensure optimum performance.

CAUTION: Always disconnect and lock out the main power sources before making electrical connections. Electrical connections should be made only by qualified personnel.

1. **Stop the dryer, disconnect the power, and follow proper lockout procedures.**
2. **Remove the plastic cover from the dryer**.
3. **Unbolt the control panel/user interface from the wheel assembly, disconnect wires, and set the interface aside.**
4. **Disconnect all the hoses and RTD's from the wheel assembly.** Be sure to note the position of all hoses and RTDs for re-assembly.
5. **Disconnect the wires to the wheel motor.**
6. **Loosen the hose clamps** on the wheel assembly, then remove hoses.
7. **Unbolt the wheel assembly** and remove it from the dryer.
8. **Bolt the new wheel assembly into place.**
9. **Return the heater tubes to their original location** and secure the hoses with the original hose clamps.
10. **Connect the wheel motor to the wiring harness.**
11. **Connect all hoses and RTDs to the wheel assembly.**
12. **Connect the wires to the control panel/user interface and bolt it to the wheel assembly.**
13. **Reconnect power and start the dryer.** Verify that the wheel rotates smoothly and in the correct direction.
14. **Replace the plastic cover**.

Replacing the Desiccant Wheel Motor

1 **Stop the dryer, disconnect and lockout the main power.**

2 **Remove the plastic cover from the dryer.**

3 **Disconnect wires to the desiccant wheel motor.**

CAUTION: Always disconnect and lock out the main power sources before making electrical connections. Electrical connections should be made only by qualified personnel.

4 **Remove the two (2) screws then remove the motor and motor bracket** from the wheel manifold.

5 **Loosen the set screw then remove the coupling from the motor shaft.**

6 **Remove the four (4) screws then remove the motor from the motor bracket**.

7 **Align the new motor with the holes in the original bracket.** Secure the new motor to the bracket using the original four (4) screws.

8 **Position the coupling on the motor shaft and tighten the set screw** against the flat side of the motor shaft.

9 **Position the motor and bracket on the desiccant wheel manifold.** Secure the assembly using the original two (2) screws.

NOTE: It may be necessary to apply power to the motor to position the coupling. Do not turn the motor shaft by hand. This will damage the gears.

10 **Connect the wires to the motor.**

11 **Replace the plastic cover.**

We're Here to Help

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Department for a nominal fee. Most manuals can be downloading free of charge from the product section of the Conair website. www.conairnet.com

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

✎ **NOTE:** Normal operating hours are 8:00 AM - 5:00 PM. After hours emergency service is available at the same phone number.

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department.

Before You Call...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, control type and serial numbers from the serial tag, and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Equipment Guarantee

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

Performance Warranty

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

Warranty Limitations

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Cleaning the Precooler Coils

If you have the optional precooler, you need to clean the coils to keep them working efficiently. Cleaning frequency depends on the type and amount of material you process.

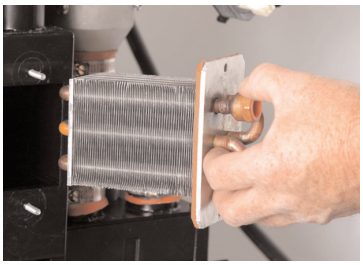
1 Stop the dryer and lockout the main power.

2 Turn off the water flow to the water supply line. Disconnect supply and return lines.

NOTE: If an optional flow control was added with the precooler, remove the compression fitting from the precooler inlet. Loosen the fitting on the flow control, then swing the copper water supply tube out and away from the precooler inlet.

3 Remove the two (2) nuts securing the precooler in the housing.

TIP: If the precooler (without a flow control) was installed using the recommended 24 inch {61 cm} of flexible hoses, there is no need to disconnect the hoses from the precooler inlet and outlet.



4 Remove the precooler assembly from the precooler housing.

5 Clean the assembly using a mild soap and water. Let the assembly dry thoroughly before installation.

6 Inspect the condition of the gasket. If it is damaged, replace the gasket.

7 Reassemble by repeating the steps in reverse order.

8 Connect the water supply line to the inlet. If a manual shut off valve is used, it should be mounted on the inlet line as well.

9 Connect the outlet of the precooler to the inlet of the flow control valve using the pre-shaped copper tubing and compression fittings provided.